



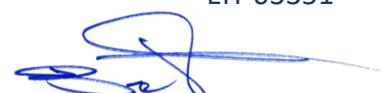
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STORMWATER MANAGEMENT REPORT
For
PRELIMINARY AND FINAL MAJOR SITE FOR
LAURISTON PARK
BLOCK 124, LOT 31
BOROUGH OF RUMSON
MONMOUTH COUNTY, NEW JERSEY



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EIT-03351



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1.0 INTRODUCTION

The project site is located within Block 124, Lot 31 in the Borough of Rumson, Monmouth County, New Jersey. The subject property is located within the RR, Rumson Road Housing Zoning District. The current use of the property is an unoccupied existing residential dwelling and related amenities including driveways, detached garage, sheds, hardscaping, and debris piles. The applicant is proposing to demolish the existing dwelling and remove all existing amenities throughout the site and construct two triplex units, two carriage houses, two duplex units and a detached garage. Other associated improvements include driveways, landscaping, utilities, a stormwater management system and lighting.

2.0 BASIS OF ENGINEERING ANALYSIS

All stormwater management systems, including collection and conveyance structures, water quality, and detention measures (BMP'S) have been designed in accordance with the provisions of the N.J.A.C. 7:8 New Jersey Stormwater Management Rules (NJSMR) and the Borough of Rumson Stormwater Management ordinance. The New Jersey Stormwater Best Management Practices Manual dated April 2004 (NJDEP-BMP) was used as a technical guidance to comply with the above regulations.

The Soil Survey of Monmouth County, New Jersey, published by The NRCS Web Soil Survey, National Cooperative Soil Survey, was used to obtain the required soil information for the project. Drainage area delineations were based upon site specific topographic survey of the site.

Due to the small size of the drainage areas and the uniformity of the surface cover and topography, the hydrologic analysis undertaken in the calculation of the storm peak runoff rates and hydrographs were performed utilizing the Modified Rational Method as outlined in the NJBMP Manual. The PondPack v8i Computer Program was used to generate the runoff hydrographs and hydrologic model for the project site.

A detention basin was designed to reduce the post-development peak runoff rates for the 2-year, 10-year and 100-year storms to 50%, 75% and 80% of the present conditions rates.

The proposed storm sewer conveyance system was designed using the Rational Method with a 25-year frequency and runoff coefficients from, table 7.1 of the New Jersey Residential Site Improvement Standards.

3.0 EXISTING CONDITIONS

The project site is located at 91 Rumson Road, Rumson, NJ. The land cover consists of open grassed areas, wooded areas, an existing residential dwelling, driveways, a garage, sheds and other amenities. The area is divided into 4 different drainage areas. Drainage Area 1 is the major portion of the site that is to be developed and consists of open lawn areas, wooded areas, portions of the driveways and a portion of the existing dwelling and flows East onto Osprey Lane. Drainage Area 2 consists of open grassed areas, partially wooded areas, a detached garage, and a portion of the existing driveway and is flows South onto lot 30. Drainage Area 3 consists of open lawn areas, wooded areas, portions of the driveways, sheds, a portion of the existing dwelling and flows Southwest onto the corner of the property. Drainage Area 4 consists of open lawn areas, wooded areas, portions of the driveways, and flows east to Osprey Lane. The following table contains the present conditions peak flow rates at each of the drainage areas:

Table 3.1

| Estimated Pre-Development Peak Runoff Rates at DA-1, cfs | | |
|---|--------------|---------------|
| 2-Yr. Storm | 10-Yr. Storm | 100-Yr. Storm |
| 1.84 | 2.62 | 3.44 |

(Only the to-be-developed area of DA-1 was considered in this analysis)

Table 3.2

| Estimated Pre-Development Peak Runoff Rates at DA-2, cfs | | |
|---|--------------|---------------|
| 2-Yr. Storm | 10-Yr. Storm | 100-Yr. Storm |
| 1.27 | 1.81 | 2.38 |

Table 3.3

| Estimated Pre-Development Peak Runoff Rates at DA-3, cfs | | |
|---|--------------|---------------|
| 2-Yr. Storm | 10-Yr. Storm | 100-Yr. Storm |
| 6.82 | 9.75 | 12.81 |

Table 3.4

| Estimated Pre-Development Peak Runoff Rates at DA-3, cfs | | |
|---|--------------|---------------|
| 2-Yr. Storm | 10-Yr. Storm | 100-Yr. Storm |
| 2.44 | 3.52 | 4.67 |

Detailed computations are presented in Appendix C of this report.

4.0 PROPOSED CONDITIONS

In the proposed conditions, Drainage Area 1 is collected by a system of inlets, underdrains, pervious concrete pavers, a manufactured treatment device and storm sewers and then directed to a proposed underground detention basin located in the Southwest portion of the site. In Drainage Area 2, the proposed flows and impervious coverage have been reduced and the overall area has been reduced. In Drainage Area 3, the proposed flows and impervious coverage have been reduced and the overall area has been reduced. In Drainage Area 4, the proposed flows have been reduced and a portion of the proposed driveway will be constructed with pervious concrete pavers. The underground detention basin, manufactured treatment device and pervious concrete pavers have been designed to meet the requirements of the N.J.A.C. 7:8 “New Jersey Stormwater Management Rules” (NJMSR).

The following sections detail the compliance with the rules:

a. Groundwater Recharge

Based upon the NRCS Soil Survey maps, the project site contains soils with Hydrologic Soil Group Rating C and D. An analysis was performed compared the existing condition

land cover versus the proposed condition land cover using New Jersey Groundwater Recharge Spreadsheet Version 2.0. Based on the annual groundwater recharge analysis spreadsheet, the proposed conditions not result in an annual recharge deficit. See appendix E.

b. Water Quality Control

According to the NJSMR, since the project will result in more than a 0.25-acre net increase in impervious cover, the project will require compliance with the stormwater quality requirements of the rules. According to these rules, an 80% T.S.S. removal rate applies to the project site. To meet the water quality treatment requirements for the project a Manufactured Treatment Device is proposed at the upstream end of the proposed basin and is in accordance with Chapter 9.6 of the NJDEP-BMP. Detailed computations are presented in Appendix D.

A pervious concrete paver system has also been proposed to meet water quality treatment requirements and is designed in accordance with N.J.A.C. 7:8 Chapter 9.7 Pervious Paving Systems and its conformance to those regulations are demonstrated as follows:

Inflow Area

Per N.J.A.C 7:8 Chapter 9.7, the maximum allowable ratio of inflow drainage area to the surface area of the pervious pavement system is 3:1. This project proposes 2,787 sf of pervious pavers on a portion of the driveway, with 4,896 sf of other portions of the driveways contributing to this area for a ratio of 1.8:1. Therefore, this pervious paver system satisfies the maximum allowable ratio.

Another portion of the driveway has 1,961 sf of pervious pavers with no additional area contributing, therefore this pervious paver system satisfied the maximum allowable ratio.

Storage Volume

Per N.J.A.C 7:8 Chapter 4, the porous pavement system is required to have sufficient volume to fully contain the Water Quality Design Storm of 1.25-inches in the storage bed without overflow. The proposed system provides 9" of AASHTO No 2. stone as a storage bed. See appendix D for detailed calculations.

Drain Time

The storage bed must drain completely within 72 hours of a rain event in order to provide sufficient storage for the next rain event as well as prevent anaerobic standing water conditions. In order to ensure the proposed system is capable of draining the water quality storm within 72 hours, a minimum flow rate for the proposed 4" undrains was calculated using a minimum slope of 2.5%. This slope was chosen as the underdrains will match the slope of the pavement above, and all of the pavement area will be at or above this slope, making 2.5% a conservative value to ensure that the entirety of the underdrain network will drain in a sufficient time period. See appendix D for detailed calculations.

c. Water Quantity Control

The NJSMR requires that the post-developed site must achieve a reduction of 50%, 25%, and 20% of the pre-developed peak discharges for the 2, 10, and 100-year storms respectively. These reduction rates apply to the disturbed portion of the site only. No reduction is required for the runoff from the undisturbed portions of the site. The proposed detention basin was designed with an outlet control structure to meet the post-development peak runoff rate reductions of the NJSMR.

The following tables summarize the routing computations for the pre-development versus post-development peak run-off rates for Drainage Area 1:

Table 4.1

| Summary of Routing at the Proposed Detention Basin (DA-1) | | | |
|---|----------------------|-----------------------|---------------------------------|
| Storm Frequency (Year) | Peak Inflow (CFS) | Peak Outflow (CFS) | Maximum Water Surface Elevation |
| 2 | 2.26 | 0.85 | 12.48 |
| 10 | 3.60 | 1.28 | 13.11 |
| 100 | 4.94 | 2.70 | 13.79 |

Table 4.2

| Pre-Development vs Post-development Peak Runoff Rate, cfs (DA-1) | | | | | |
|--|---|-------------------------------------|--|--|------|
| Storm Frequency (Year) | Pre-Development Peak Runoff Rate, (cfs) | Minimum Required Reduction NJAC 7:8 | Maximum Allowable Post-Development Peak Runoff Rate, cfs | Estimated Post-Development Peak Runoff Rate, (cfs) | |
| 2 | 1.84 | 50% | 0.92 | 0.85 | O.K. |
| 10 | 2.62 | 75% | 1.97 | 1.28 | O.K. |
| 100 | 3.44 | 80% | 2.75 | 2.70 | O.K. |

The following table summarizes the pre-development versus post-development peak run-off rates for Drainage Area 2:

Table 4.3

| Summary of Pre-Development vs Post-Development Peak Runoff Rates, DA-2* | | | |
|---|---|--|--|
| Storm Frequency (Year) | Pre-Development Peak Runoff Rate, (cfs) | Estimated Post-Development Peak Runoff Rate, (cfs) | Estimated Post-Development Less than Pre-Development Peak Runoff Rate, (cfs) |
| 2 | 1.27 | 0.68 | O.K. |
| 10 | 1.81 | 0.96 | O.K. |
| 100 | 2.38 | 1.27 | O.K. |

*Project does not increase impervious coverage therefore there will be no increase in peak runoff rates from this area, flow reductions are not required.

The following table summarizes the pre-development versus post-development peak run-off rates for Drainage Area 3:

Table 4.4

| Summary of Pre-Development vs Post-Development Peak Runoff Rates, DA-3* | | | |
|--|--|---|--|
| Storm Frequency (Year) | Pre-Development Peak Runoff Rate, (cfs) | Estimated Post-Development Peak Runoff Rate, (cfs) | Estimated Post- Development Less than Pre-Development Peak Runoff Rate, (cfs) |
| 2 | 6.82 | 5.78 | O.K. |
| 10 | 9.75 | 8.24 | O.K. |
| 100 | 12.81 | 10.82 | O.K. |

*Project does not increase impervious coverage therefore there will be no increase in peak runoff rates from this area, flow reductions are not required.

The following table summarizes the pre-development versus post-development peak run-off rates for Drainage Area 4:

Table 4.5

| Summary of Pre-Development vs Post-Development Peak Runoff Rates, DA-4* | | | |
|--|--|---|--|
| Storm Frequency (Year) | Pre-Development Peak Runoff Rate, (cfs) | Estimated Post-Development Peak Runoff Rate, (cfs) | Estimated Post- Development Less than Pre-Development Peak Runoff Rate, (cfs) |
| 2 | 2.44 | 2.41 | O.K. |
| 10 | 3.52 | 3.47 | O.K. |
| 100 | 4.67 | 4.60 | O.K. |

* There will be no increase in peak runoff rates from this area therefore flow reductions are not required.

Detailed computations are presented in Appendix D of this report.

d. Low Impact Development

As per NJAC 7:8-5.3, Nonstructural stormwater management strategies we offer the following:

1. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss – **We are providing soil erosion and sediment control measures in accordance with the New Jersey Standards and minimizing steep slopes.**
2. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces – **We have minimized the impervious surface for the proposed parking spaces and drive aisles. We have disconnected the flows of runoff by using pervious pavers.**
3. Maximize the protection of natural drainage features and vegetation – **The existing natural drainage features and vegetation around the site is not to be disturbed and we have provided silt fence along the limit of disturbance to protect this area during construction. New landscaping and native plantings are also being proposed throughout the project site.**
4. Minimize the decrease in the “time of concentration” from the pre-construction to post construction. “Time of concentration” is defined as the time it takes for runoff to travel from the hydraulically most distant point of the drainage area to the point of interest within a watershed. – **The stormwater management system has been designed to minimize the decrease in the time of concentration. The basin has been designed to hold back the stormwater runoff and slowly release the discharge from the basin.**
5. Minimize land disturbance including clearing and grading – **The design of the project has taken into consideration to minimize the land disturbance and clearing of the site. In addition, a soil erosion and sediment control plan has been prepared to control the land disturbance and specify soil erosion measures for this project in accordance with the New Jersey Standards.**
6. Minimize soil compaction – **All landscape areas and existing wooded areas to remain shall not require heavy compaction of the soils. Light weight equipment shall be utilized throughout the project, where applicable.**

7. Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides – **The landscape design does provide low maintenance landscaping with mostly native vegetation and relocation of existing vegetation.**
8. Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas – **The proposed porous pavers will minimize channeling and the basin will convey and control the stormwater runoff and then discharge into the existing system.**
9. Provide other source controls to prevent or minimize the use or exposure of pollutants at the site in order to prevent or minimize the release of those pollutants into the stormwater runoff. These source controls include, but not limited to:
 - i. Site design features that help to prevent accumulation of trash and debris in drainage system – **We are proposing N-Eco inlet curb heads.**
 - ii. Site design features that help to prevent discharge of trash and debris from drainage system – **We are proposing a trash rack on the outlet control structure.**
 - iii. Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at commercial developments –**The site has been designed to have porous pavers on the site to filter any harmful accumulations and a manufactured treatment device.**
 - iv. When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act and implementing rules. – **We have provided the fertilizer standards on our plans that are consistent with the Soil Erosion and Sediment Control Act and a soil erosion and sediment control application will be prepared for certification of the project.**

5.0 CONCLUSION

Based upon the presented computations, the proposed stormwater management measures meet the requirements of the N.J.A.C. 7:8 “New Jersey Stormwater Management Rules”.

APPENDIX A
Supporting Documents

**NOAA Atlas 14, Volume 2, Version 3****Location name:** Rumson, New Jersey, USA***Latitude:** 40.3653°, **Longitude:** -73.9796°**Elevation:** 12.2 ft**

* source: ESRI Maps

** source: USGS

**POINT PRECIPITATION FREQUENCY ESTIMATES**

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M. Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerials](#)
PF tabular

| Duration | Annual exceedance probability (1/years) | | | | | | | | |
|---------------|---|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | 1/2 | 1/5 | 1/10 | 1/25 | 1/50 | 1/100 | 1/200 | 1/500 | 1/1000 |
| 5-min | 4.54 (4.10-5.02) | 5.70 (5.16-6.30) | 6.43 (5.82-7.13) | 7.31 (6.58-8.09) | 7.92 (7.07-8.75) | 8.53 (7.57-9.44) | 9.10 (8.03-10.1) | 9.83 (8.56-11.0) | 10.4 (8.96-11.7) |
| 10-min | 3.62 (3.28-4.00) | 4.55 (4.12-5.03) | 5.14 (4.64-5.68) | 5.81 (5.23-6.42) | 6.28 (5.62-6.94) | 6.76 (6.00-7.48) | 7.19 (6.34-7.99) | 7.75 (6.74-8.66) | 8.16 (7.04-9.17) |
| 15-min | 3.03 (2.74-3.35) | 3.83 (3.47-4.24) | 4.33 (3.91-4.78) | 4.91 (4.41-5.42) | 5.30 (4.74-5.86) | 5.69 (5.05-6.30) | 6.04 (5.33-6.71) | 6.50 (5.65-7.26) | 6.84 (5.90-7.68) |
| 30-min | 2.09 (1.89-2.31) | 2.72 (2.46-3.01) | 3.13 (2.83-3.46) | 3.62 (3.26-4.01) | 3.98 (3.56-4.40) | 4.34 (3.86-4.81) | 4.69 (4.13-5.21) | 5.15 (4.48-5.76) | 5.50 (4.75-6.19) |
| 60-min | 1.31 (1.19-1.45) | 1.74 (1.58-1.93) | 2.03 (1.84-2.25) | 2.41 (2.17-2.66) | 2.69 (2.41-2.98) | 2.99 (2.65-3.31) | 3.29 (2.90-3.65) | 3.69 (3.21-4.13) | 4.01 (3.46-4.51) |
| 2-hr | 0.813 (0.734-0.901) | 1.09 (0.984-1.21) | 1.28 (1.15-1.42) | 1.54 (1.37-1.70) | 1.74 (1.55-1.93) | 1.95 (1.72-2.17) | 2.17 (1.90-2.42) | 2.48 (2.14-2.77) | 2.73 (2.33-3.07) |
| 3-hr | 0.598 (0.543-0.665) | 0.804 (0.727-0.894) | 0.948 (0.855-1.05) | 1.14 (1.02-1.27) | 1.30 (1.15-1.44) | 1.46 (1.29-1.62) | 1.63 (1.42-1.81) | 1.87 (1.61-2.09) | 2.07 (1.75-2.32) |
| 6-hr | 0.381 (0.345-0.423) | 0.509 (0.460-0.565) | 0.601 (0.541-0.666) | 0.728 (0.649-0.806) | 0.830 (0.735-0.920) | 0.939 (0.822-1.04) | 1.05 (0.915-1.17) | 1.22 (1.04-1.36) | 1.36 (1.15-1.52) |
| 12-hr | 0.230 (0.208-0.255) | 0.310 (0.280-0.343) | 0.368 (0.331-0.407) | 0.451 (0.402-0.498) | 0.520 (0.460-0.573) | 0.594 (0.519-0.656) | 0.675 (0.582-0.747) | 0.794 (0.672-0.883) | 0.896 (0.746-1.00) |
| 24-hr | 0.130 (0.120-0.143) | 0.178 (0.163-0.196) | 0.216 (0.197-0.236) | 0.269 (0.244-0.293) | 0.315 (0.283-0.343) | 0.366 (0.327-0.398) | 0.424 (0.374-0.460) | 0.511 (0.443-0.554) | 0.586 (0.502-0.638) |
| 2-day | 0.077 (0.071-0.086) | 0.106 (0.096-0.116) | 0.127 (0.115-0.140) | 0.158 (0.143-0.174) | 0.184 (0.165-0.202) | 0.213 (0.189-0.234) | 0.245 (0.216-0.270) | 0.293 (0.254-0.324) | 0.335 (0.286-0.371) |
| 3-day | 0.054 (0.050-0.060) | 0.074 (0.068-0.081) | 0.089 (0.081-0.097) | 0.110 (0.100-0.120) | 0.128 (0.115-0.139) | 0.147 (0.132-0.161) | 0.169 (0.150-0.185) | 0.201 (0.176-0.220) | 0.229 (0.197-0.252) |
| 4-day | 0.043 (0.040-0.047) | 0.058 (0.054-0.063) | 0.070 (0.064-0.076) | 0.086 (0.078-0.093) | 0.099 (0.090-0.108) | 0.114 (0.103-0.124) | 0.131 (0.117-0.142) | 0.155 (0.136-0.169) | 0.176 (0.153-0.192) |
| 7-day | 0.028 (0.026-0.030) | 0.037 (0.035-0.040) | 0.044 (0.041-0.048) | 0.054 (0.050-0.058) | 0.062 (0.057-0.067) | 0.071 (0.064-0.076) | 0.080 (0.072-0.086) | 0.094 (0.083-0.102) | 0.105 (0.092-0.115) |
| 10-day | 0.022 (0.021-0.024) | 0.029 (0.027-0.031) | 0.034 (0.032-0.036) | 0.041 (0.038-0.044) | 0.046 (0.043-0.050) | 0.052 (0.048-0.056) | 0.058 (0.053-0.063) | 0.068 (0.061-0.073) | 0.076 (0.067-0.082) |
| 20-day | 0.015 (0.014-0.016) | 0.019 (0.018-0.020) | 0.022 (0.020-0.023) | 0.025 (0.024-0.027) | 0.028 (0.026-0.030) | 0.031 (0.029-0.033) | 0.034 (0.031-0.036) | 0.038 (0.035-0.040) | 0.041 (0.037-0.044) |
| 30-day | 0.012 (0.012-0.013) | 0.015 (0.014-0.016) | 0.017 (0.016-0.018) | 0.020 (0.019-0.021) | 0.022 (0.020-0.023) | 0.024 (0.022-0.025) | 0.025 (0.024-0.027) | 0.028 (0.026-0.030) | 0.030 (0.027-0.032) |
| 45-day | 0.010 (0.010-0.011) | 0.013 (0.012-0.013) | 0.014 (0.013-0.015) | 0.016 (0.015-0.017) | 0.017 (0.016-0.018) | 0.019 (0.018-0.020) | 0.020 (0.019-0.021) | 0.022 (0.020-0.023) | 0.023 (0.021-0.024) |
| 60-day | 0.009 (0.009-0.010) | 0.011 (0.011-0.012) | 0.012 (0.012-0.013) | 0.014 (0.013-0.015) | 0.015 (0.014-0.016) | 0.016 (0.015-0.017) | 0.017 (0.016-0.018) | 0.018 (0.017-0.019) | 0.019 (0.018-0.020) |

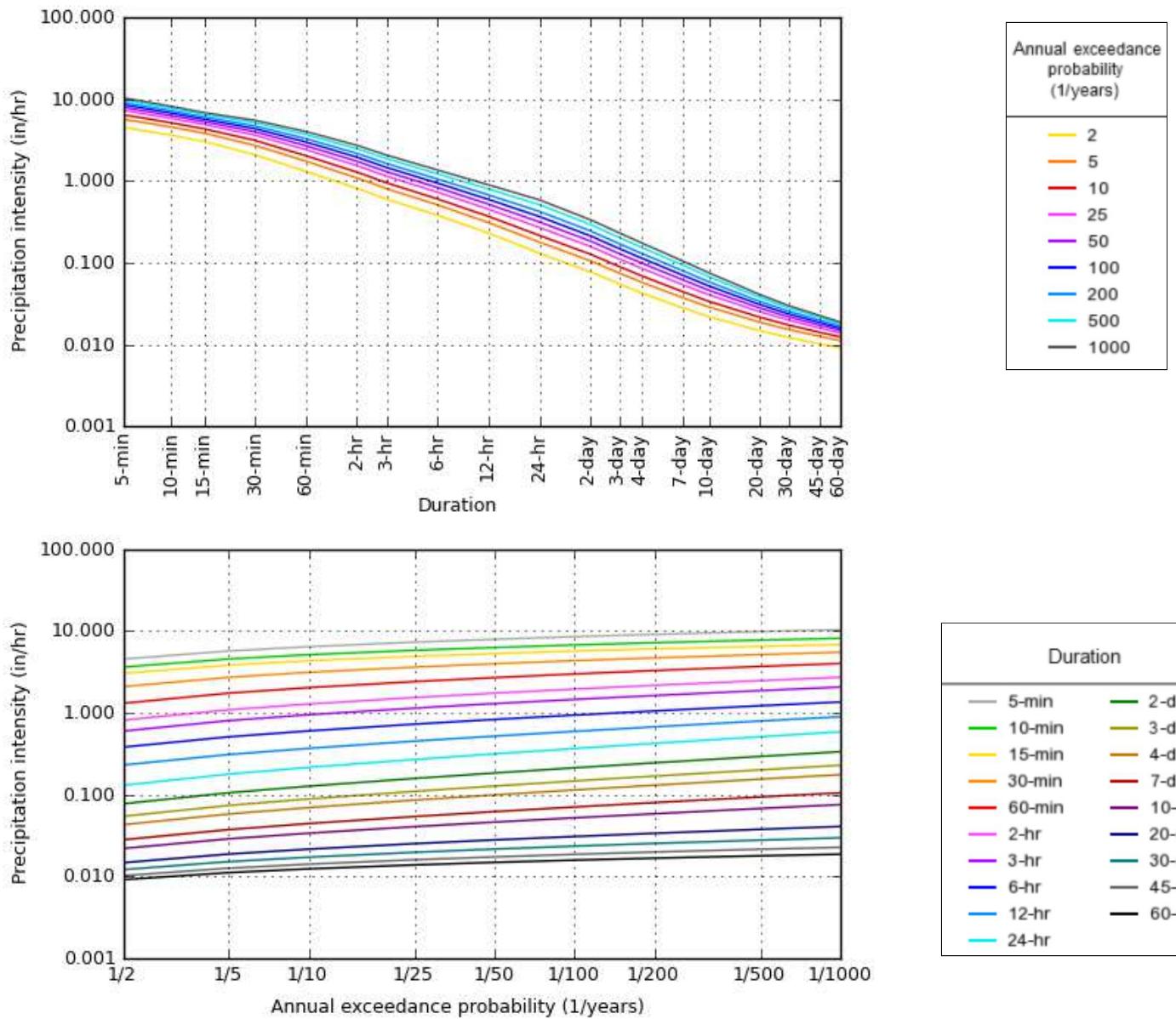
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of annual maxima series (AMS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and annual exceedance probability) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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AMS-based intensity-duration-frequency (IDF) curves
Latitude: 40.3653°, Longitude: -73.9796°



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TABLE 7.1

TYPICAL RUNOFF COEFFICIENTS (C VALUES) FOR 100 YEAR FREQUENCY STORM

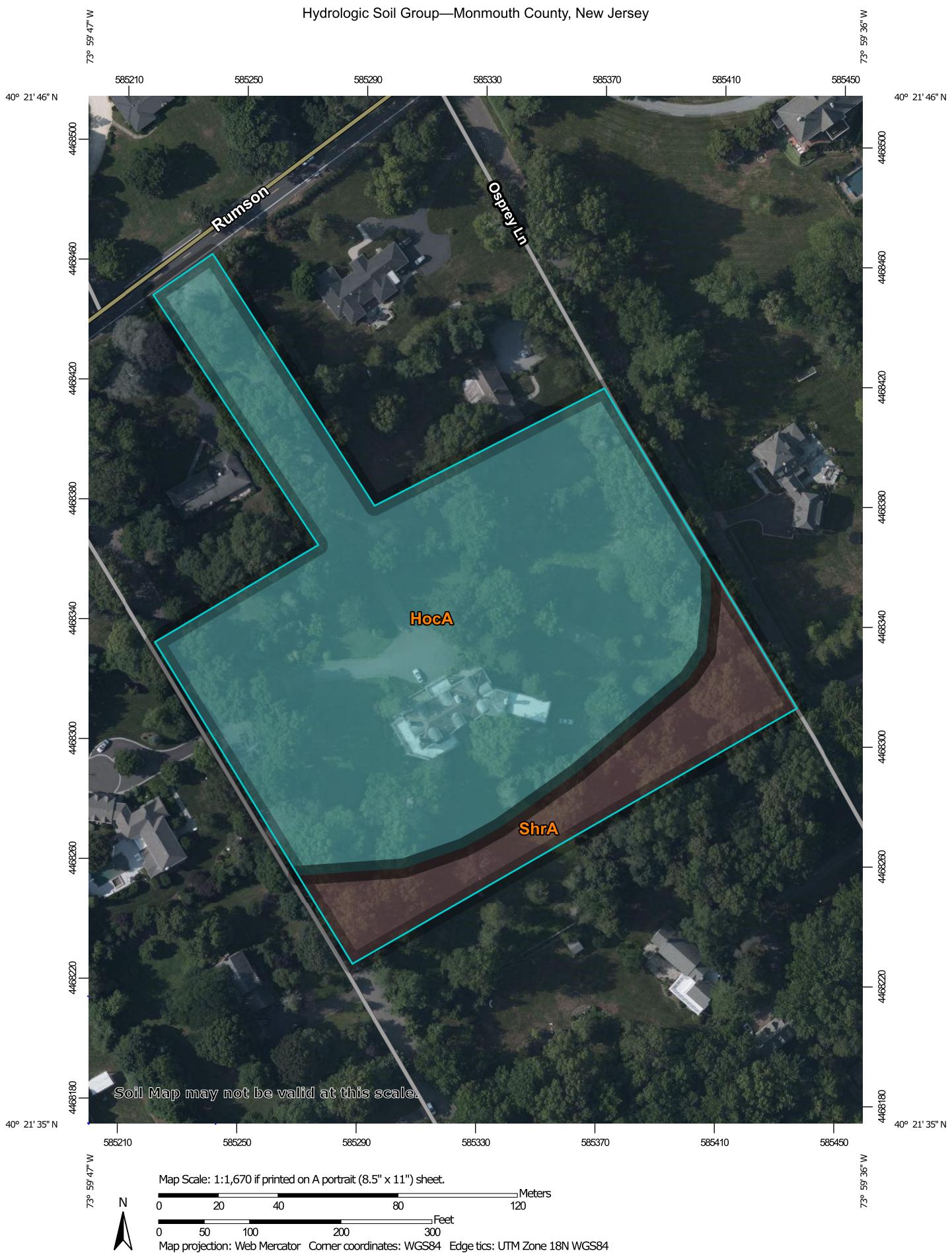
TABLE 7.1
TYPICAL RUNOFF COEFFICIENTS (C VALUES) FOR 100 YEAR FREQUENCY STORM

| <u>Land Use Description</u> | <u>A</u> | <u>B</u> | <u>C</u> | <u>D</u> |
|---|----------|----------|-----------------------|----------|
| | | | Hydrologic Soil Group | |
| <u>Cultivated land:</u> | | | | |
| without conservation treatment | 0.49 | 0.67 | 0.81 | 0.88 |
| with conservation treatment | 0.27 | 0.43 | 0.61 | 0.67 |
| <u>Pasture or range land:</u> | | | | |
| poor condition | 0.38 | 0.63 | 0.78 | 0.84 |
| good condition | NA | 0.25 | 0.51 | 0.65 |
| <u>Meadow: good condition</u> | NA | NA | 0.44 | 0.61 |
| <u>Wood or forest land:</u> | | | | |
| thin stand, poor cover, no mulch | NA | NA | 0.59 | 0.79 |
| good cover | NA | NA | 0.45 | 0.59 |
| <u>Open spaces, lawns, parks, golf courses, cemeteries:</u> | | | | |
| good condition, grass cover on 75% or more of area | NA | 0.25 | 0.51 | 0.65 |
| fair condition, grass cover on 50–75% of area | NA | 0.45 | 0.63 | 0.74 |
| Commercial and business areas (85% impervious) | 0.84 | 0.90 | 0.93 | 0.96 |
| Industrial districts (72% impervious) | 0.67 | 0.81 | 0.88 | 0.92 |
| <u>Residential:</u> | | | | |
| Average lot size | | | | |
| impermeous | 0.59 | 0.76 | 0.86 | 0.90 |
| 65% acre | 0.59 | 0.55 | 0.70 | 0.80 |
| 38% acre | 0.25 | 0.49 | 0.67 | 0.78 |
| 30% acre | NA | 0.45 | 0.65 | 0.76 |
| 25% acre | NA | 0.41 | 0.63 | 0.74 |
| 20% acre | NA | 0.99 | 0.99 | 0.99 |
| 1 acre | 0.99 | | | |
| Paved parking lots, roofs, driveways, etc. | | | | |
| Streets and roads: | | | | |
| paved with curbs and storm sewers | 0.99 | 0.99 | 0.99 | 0.99 |
| gravel | 0.57 | 0.76 | 0.84 | 0.88 |
| dirt | 0.49 | 0.69 | 0.80 | 0.84 |

Note: NA denotes information is not available; design engineers should rely on another authoritative source.

Source: New Jersey Department of Environmental Protection, Technical Manual for Land Use Regulation Program, Bureaus of Inland and Coastal Regulations, Stream Encroachment Permits (Trenton, New Jersey: Department of Environmental Protection, Revised September 1995) p. 12.

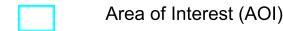
Hydrologic Soil Group—Monmouth County, New Jersey



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

1/29/2021
Page 1 of 4

MAP LEGEND**Area of Interest (AOI)****Soils****Soil Rating Polygons**

| | |
|--|----------------------------|
| | A |
| | A/D |
| | B |
| | B/D |
| | C |
| | C/D |
| | D |
| | Not rated or not available |

Soil Rating Lines

| | |
|--|----------------------------|
| | A |
| | A/D |
| | B |
| | B/D |
| | C |
| | C/D |
| | D |
| | Not rated or not available |

Soil Rating Points

| | |
|--|-----|
| | A |
| | A/D |
| | B |
| | B/D |

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monmouth County, New Jersey

Survey Area Data: Version 14, Jun 1, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 29, 2019—Jul 16, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



Hydrologic Soil Group

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|------------------------------------|--|--------|--------------|----------------|
| HocA | Holmdel sandy loam, 0 to 2 percent slopes | C | 5.0 | 83.4% |
| ShrA | Shrewsbury sandy loam, 0 to 2 percent slopes | B/D | 1.0 | 16.6% |
| Totals for Area of Interest | | | 6.0 | 100.0% |

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition



Component Percent Cutoff: None Specified

Tie-break Rule: Higher



FRENCH & PARRELLO ASSOCIATES, P.A.

1800 State Highway 34, Suite 101
Wall, New Jersey 07719

SOIL LOG

RUMSON ROAD TOWNHOUSE

MAJOR SITE PLAN

BLOCK 124, LOT 31

Borough of Rumson, Monmouth County NJ

(FPA NO. 15053.001)

SOIL LOG NO.: TP-1

SHEET NO.: 1 OF 11

DATE: 08/15/2019

GROUND ELEVATION: 15.00

WATER ELEVATION: 9.50

DEPTH OF WATER: 66"

ESHWT DEPTH: 56"

ESHWT ELEVATION: 10.33

DEPTH

DESCRIPTION

0" - 14" Topsoil

14" - 26" Dark Yellowish Brown (*10YR4/6*) **Silt loam**; crumb, loose

26" - 39" Yellowish Brown (*10YR5/6*) **Sandy clay loam**; crumb, loose

39" - 56" Dark Yellowish Brown (*10YR3/6*) **Silty clay loam**; crumb, friable

56" - 70" Dark Yellowish Brown (*10YR3/6*) **Sandy clay loam**; crumb, friable with common, medium, distinct light gray (*10YR 7/1*) mottles

END OF SOIL LOG

Notes:

Seepage at 66"

Signature of Soil Evaluator:

Mark Kalusz, EIT

Date: / /

Signature of Professional Engineer:

Brian R. Decina, P.E.
N.J.P.E. License No. 45149

Date: / /

FRENCH & PARRELLO ASSOCIATES, P.A.

1800 State Highway 34, Suite 101
Wall, New Jersey 07719

SOIL LOG

**RUMSON ROAD TOWNHOUSE
MAJOR SITE PLAN
BLOCK 124, LOT 31
Borough of Rumson, Monmouth County NJ
(FPA NO. 15053.001)**

**SOIL LOG NO.: TP-2
SHEET NO.: 2 OF 11
DATE: 08/15/2019**

**GROUND ELEVATION: 13.00
WATER ELEVATION: 8.00
DEPTH OF WATER: 60"
ESHWT DEPTH: 47"
ESHWT ELEVATION: 9.08**

| <u>DEPTH</u> | <u>DESCRIPTION</u> |
|--------------|---|
| 0" - 7" | Topsoil |
| 7" - 22" | Dark Yellowish Brown (<i>10YR4/4</i>) Silt loam ; crumb, friable |
| 22" - 47" | Yellowish Brown (<i>10YR5/6</i>) Silty clay loam ; crumb, friable |
| 47" - 50" | Dark Yellowish Brown (<i>10YR3/6</i>) Sandy clay ; subangular blocky, friable with few, fine, faint grayish brown (<i>10YR5/2</i>) mottles |
| 50" - 70" | Dark Yellowish Brown (<i>10YR3/6</i>) Sandy loam ; subangular blocky, friable with common, medium, distinct gray (<i>10YR6/1</i>) mottles |

END OF SOIL LOG

Notes:

Seepage at 60"

Signature of Soil Evaluator: _____

Mark Kalusz, EIT

Date: / /

Signature of Professional Engineer: _____

Brian R. Decina, P.E.
N.J.P.E. License No. 45149

Date: / /

FRENCH & PARRELLO ASSOCIATES, P.A.

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Wall, New Jersey 07719

SOIL LOG

RUMSON ROAD TOWNHOUSE

MAJOR SITE PLAN

BLOCK 124, LOT 31

Borough of Rumson, Monmouth County NJ

(FPA NO. 15053.001)

SOIL LOG NO.: TP-3

SHEET NO.: 3 OF 11

DATE: 08/15/2019

GROUND ELEVATION: 12.00

WATER ELEVATION: 7.17

DEPTH OF WATER: 58"

ESHWT DEPTH: 43"

ESHWT ELEVATION: 8.42

DEPTH

DESCRIPTION

0" - 12" Topsoil

12" - 43" Yellowish Brown (*10YR 5/6*) **silty clay loam**, crumb, friable

43" – 58" Dark Yellowish Brown (*10YR 4/6*) **sandy clay loam**, subangular blocky, friable with common, medium, distinct gray (*10YR 6/1*) mottles

58" – 72" Dark Yellowish Brown (*10YR 3/6*) **sandy loam**, subangular blocky, friable with common, medium, distinct gray (*10YR 6/1*) mottles

END OF SOIL LOG

Notes:

Seepage at 58"

Signature of Soil Evaluator: _____

Mark Kalusz, EIT

Date: / /

Signature of Professional Engineer: _____

Brian R. Decina, P.E.
N.J.P.E. License No. 45149

Date: / /

FRENCH & PARRELLO ASSOCIATES, P.A.

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Wall, New Jersey 07719

SOIL LOG

**RUMSON ROAD TOWNHOUSE
MAJOR SITE PLAN
BLOCK 124, LOT 31
Borough of Rumson, Monmouth County NJ
(FPA NO. 15053.001)**

**SOIL LOG NO.: TP-4
SHEET NO.: 4 OF 11
DATE: 9/10/2018**

**GROUND ELEVATION: 11.5
WATER ELEVATION: 7.33
DEPTH OF WATER: 50"
ESHWT DEPTH: 36"
ESHWT ELEVATION: 8.50**

| <u>DEPTH</u> | <u>DESCRIPTION</u> |
|--------------|---|
| 0" - 8" | Topsoil |
| 8" - 36" | Yellowish Brown (<i>10YR 5/6</i>) silty clay loam , crumb, friable |
| 36" – 68" | Dark Yellowish Brown (<i>10YR 4/6</i>) sandy clay loam , crumb, loose with common, medium distinct light brownish gray (<i>10YR 6/2</i>) mottles |

END OF SOIL LOG

Notes:

Seepage at 50"

Signature of Soil Evaluator: _____

Mark Kalusz, EIT

Date: / /

Signature of Professional Engineer: _____

Brian R. Decina, P.E.
N.J.P.E. License No. 45149

Date: / /

FRENCH & PARRELLO ASSOCIATES, P.A.

1800 State Highway 34, Suite 101
Wall, New Jersey 07719

SOIL LOG

**RUMSON ROAD TOWNHOUSE
MAJOR SITE PLAN
BLOCK 124, LOT 31
Borough of Rumson, Monmouth County NJ
(FPA NO. 15053.001)**

**SOIL LOG NO.: TP-5
SHEET NO.: 5 OF 11
DATE: 9/10/2018**

**GROUND ELEVATION: 16.40
WATER ELEVATION: 11.65
DEPTH OF WATER: 57"
ESHWT DEPTH: 57"
ESHWT ELEVATION: 11.65**

| <u>DEPTH</u> | <u>DESCRIPTION</u> |
|---------------------|--|
| 0" - 12" | Topsoil |
| 12" - 27" | Dark Yellowish Brown (<i>10YR 4/6</i>) silt loam, crumb, loose |
| 27" - 80" | Dark Yellowish Brown (<i>10YR 3/6</i>) silty clay loam, crumb, friable |
| 80"- 96" | Dark Yellowish Brown (<i>10R 3/6</i>) sandy clay loam; crumb, friable with common, medium, distinct pale brown (<i>10YR 6/3</i>) mottles |

END OF SOIL LOG

Notes:

Seepage at 57"

Signature of Soil Evaluator: _____

Mark Kalusz, EIT

Date: / /

Signature of Professional Engineer: _____

Brian R. Decina, P.E.
N.J.P.E. License No. 45149

Date: / /

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SOIL LOG

**RUMSON ROAD TOWNHOUSE
MAJOR SITE PLAN
BLOCK 124, LOT 31
Borough of Rumson, Monmouth County NJ
(FPA NO. 15053.001)**

SOIL LOG NO.: TP-6

SHEET NO.: 6 OF 11

DATE: 01-14-2021

GROUND ELEVATION: 14.0

WATER ELEVATION: 9.7

DEPTH OF WATER: 52"

ESHWT DEPTH: 50"

ESHWT ELEVATION: 9.8

DEPTH

DESCRIPTION

0" - 8" Topsoil

8" - 22" Yellowish Brown (*10YR 5/8*) **sandy clay loam**, subangular blocky, friable

22" - 50" Dark Yellowish Brown (*10YR 3/6*) **sandy loam**, crumb, friable

50"- 70" Light Brownish Gray (*10R 6/2*) **sandy loam**; crumb, friable with common, medium, distinct yellowish red (*5YR 4/6*) mottles

70"- 90" Dark Yellowish Brown (*10YR 5/6*) **sandy loam**, crumb, friable

END OF SOIL LOG

Notes:

Seepage at 52"

Signature of Soil Evaluator: _____

Mark Kalusz, EIT

Date: ___ / ___

Signature of Professional Engineer: _____

Brian R. Decina, P.E.
N.J.P.E. License No. 45149

Date: ___ / ___

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SOIL LOG

**RUMSON ROAD TOWNHOUSE
MAJOR SITE PLAN
BLOCK 124, LOT 31
Borough of Rumson, Monmouth County NJ
(FPA NO. 15053.001)**

SOIL LOG NO.: TP-7

SHEET NO.: 7 OF 11

DATE: 01-14-2021

GROUND ELEVATION: 13.0

WATER ELEVATION: 8.0

DEPTH OF WATER: 60"

ESHWT DEPTH: 54"

ESHWT ELEVATION: 8.5

DEPTH

DESCRIPTION

0" - 9" Topsoil

9" - 24" Yellowish Brown (*10YR 5/8*) **sandy clay loam**, subangular blocky, friable

24" - 54" Dark Yellowish Brown (*10YR 3/6*) **sandy loam**, crumb, friable

54"- 72" Light Brownish Gray (*10R 6/2*) **sandy loam**; crumb, friable with common, medium, distinct yellowish red (*5YR 4/6*) mottles

72"- 96" Dark Yellowish Brown (*10YR 5/6*) **sandy loam**, crumb, friable

END OF SOIL LOG

Notes:

Seepage at 60"

Signature of Soil Evaluator: _____

Mark Kalusz, EIT

Date: ___ / ___

Signature of Professional Engineer: _____

Brian R. Decina, P.E.
N.J.P.E. License No. 45149

Date: ___ / ___

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Wall, New Jersey 07719

SOIL LOG

**RUMSON ROAD TOWNHOUSE
MAJOR SITE PLAN
BLOCK 124, LOT 31
Borough of Rumson, Monmouth County NJ
(FPA NO. 15053.001)**

SOIL LOG NO.: TP-8

SHEET NO.: 8 OF 11

DATE: 01-14-2021

GROUND ELEVATION: 14.8

WATER ELEVATION: 9.6

DEPTH OF WATER: 62"

ESHWT DEPTH: 57"

ESHWT ELEVATION: 10.05

DEPTH

DESCRIPTION

0" - 8" Topsoil

8" - 22" Yellowish Brown (*10YR 5/8*) **sandy clay loam**, subangular blocky, friable

22" - 57" Dark Yellowish Brown (*10YR 3/6*) **sandy loam**, crumb, friable

57"- 74" Light Brownish Gray (*10R 6/2*) **sandy loam**; crumb, friable with common, medium, distinct yellowish red (*5YR 4/6*) mottles

74"- 92" Dark Yellowish Brown (*10YR 5/6*) **sandy loam**, crumb, friable

END OF SOIL LOG

Notes:

Seepage at 62"

Signature of Soil Evaluator: _____

Mark Kalusz, EIT

Date: ___ / ___

Signature of Professional Engineer: _____

Brian R. Decina, P.E.
N.J.P.E. License No. 45149

Date: ___ / ___

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Wall, New Jersey 07719

SOIL LOG

**RUMSON ROAD TOWNHOUSE
MAJOR SITE PLAN
BLOCK 124, LOT 31
Borough of Rumson, Monmouth County NJ
(FPA NO. 15053.001)**

SOIL LOG NO.: TP-9

SHEET NO.: 9 OF 11

DATE: 01-14-2021

GROUND ELEVATION: 14.0

WATER ELEVATION: 9.2

DEPTH OF WATER: 58"

ESHWT DEPTH: 55"

ESHWT ELEVATION: 9.4

DEPTH

DESCRIPTION

0" - 4" Topsoil

4" - 25" Yellowish Brown (*10YR 5/8*) **sandy clay loam**, subangular blocky, friable

25" - 55" Dark Yellowish Brown (*10YR 3/6*) **sandy loam**, crumb, friable

55"- 77" Light Brownish Gray (*10R 6/2*) **sandy loam**; crumb, friable with common, medium, distinct yellowish red (*5YR 4/6*) mottles

77"- 92" Dark Yellowish Brown (*10YR 5/6*) **sandy loam**, crumb, friable

END OF SOIL LOG

Notes:

Seepage at 58"

Signature of Soil Evaluator: _____

Mark Kalusz, EIT

Date: ___ / ___

Signature of Professional Engineer: _____

Brian R. Decina, P.E.
N.J.P.E. License No. 45149

Date: ___ / ___

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Wall, New Jersey 07719

SOIL LOG

**RUMSON ROAD TOWNHOUSE
MAJOR SITE PLAN
BLOCK 124, LOT 31
Borough of Rumson, Monmouth County NJ
(FPA NO. 15053.001)**

SOIL LOG NO.: TP-10

SHEET NO.: 10 OF 11

DATE: 01-14-2021

GROUND ELEVATION: 16.2

WATER ELEVATION: 10.0

DEPTH OF WATER: 74"

ESHWT DEPTH: 67"

ESHWT ELEVATION: 10.6

| <u>DEPTH</u> | <u>DESCRIPTION</u> |
|--------------|--|
| 0" - 8" | Topsoil |
| 8" - 32" | Yellowish Brown (<i>10YR 5/8</i>) sandy clay loam , subangular blocky, friable |
| 32" - 67" | Dark Yellowish Brown (<i>10YR 3/6</i>) sandy loam , crumb, friable |
| 67"- 88" | Light Brownish Gray (<i>10R 6/2</i>) sandy loam ; crumb, friable with common, medium, distinct yellowish red (<i>5YR 4/6</i>) mottles |
| 88"- 103" | Dark Yellowish Brown (<i>10YR 5/6</i>) sandy loam , crumb, friable |

END OF SOIL LOG

Notes:

Seepage at 74"

Signature of Soil Evaluator: _____

Mark Kalusz, EIT

Date: ____ / ____ / ____

Signature of Professional Engineer: _____

Brian R. Decina, P.E.
N.J.P.E. License No. 45149

Date: ____ / ____ / ____

FRENCH & PARRELLO ASSOCIATES, P.A.

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Wall, New Jersey 07719

SOIL LOG

**RUMSON ROAD TOWNHOUSE
MAJOR SITE PLAN
BLOCK 124, LOT 31
Borough of Rumson, Monmouth County NJ
(FPA NO. 15053.001)**

SOIL LOG NO.: TP-11

SHEET NO.: 11 OF 11

DATE: 01-14-2021

GROUND ELEVATION: 14.8

WATER ELEVATION: 10.2

DEPTH OF WATER: 55"

ESHWT DEPTH: 40"

ESHWT ELEVATION: 11.5

| <u>DEPTH</u> | <u>DESCRIPTION</u> |
|--------------|--|
| 0" - 10" | Topsoil |
| 10" - 21" | Yellowish Brown (<i>10YR 5/8</i>) sandy clay loam , subangular blocky, friable |
| 21" - 40" | Dark Yellowish Brown (<i>10YR 3/6</i>) sandy loam , crumb, friable |
| 40"- 70" | Light Brownish Gray (<i>10R 6/2</i>) sandy loam ; crumb, friable with common, medium, distinct yellowish red (<i>5YR 4/6</i>) mottles |
| 70"- 92" | Dark Yellowish Brown (<i>10YR 5/6</i>) sandy loam , crumb, friable |

END OF SOIL LOG

Notes:

Seepage at 55"

Signature of Soil Evaluator: _____

Mark Kalusz, EIT

Date: ____ / ____ / ____

Signature of Professional Engineer: _____

Brian R. Decina, P.E.
N.J.P.E. License No. 45149

Date: ____ / ____ / ____

APPENDIX B
Storm Sewer Calculations



Telephone : (732) 312-9800
Fax : (732) 312-9801

1800 Route 34, Suite 101
Wall, New Jersey 07719

| | |
|---------------------|-----------------|
| PROJECT NUMBER : | 15053.003 |
| PROJECT NAME : | 91 Rumson Road |
| CALCULATED BY : MWK | DATE: 1/25/2021 |
| CHECKED BY : | DATE: |
| REVISED BY : | DATE: |

RUNOFF COEFFICIENT WORKSHEET

| STRUCTURE NUMBER | SURFACE TYPE | AREA, A (ACRES) | RUNOFF COEFF. (C) | A x C | COMPOSITE RUNOFF COEFF. C = (A x C)/ A |
|------------------|--------------|-----------------|-------------------|-------|--|
| A 1 | IMPERVIOUS | 0.10 | 0.99 | 0.10 | 0.96 |
| | Lawn Area D | 0.01 | 0.65 | 0.01 | |
| | | | | | |
| | | | | | |
| | | 0.11 | | 0.11 | |
| A 2 | IMPERVIOUS | 0.05 | 0.99 | 0.05 | 0.93 |
| | Lawn Area D | 0.01 | 0.65 | 0.01 | |
| | | | | | |
| | | | | | |
| | | 0.06 | | 0.06 | |
| A 3 | IMPERVIOUS | 0.16 | 0.99 | 0.16 | 0.92 |
| | Lawn Area D | 0.04 | 0.65 | 0.03 | |
| | | | | | |
| | | | | | |
| | | 0.20 | | 0.18 | |
| A 4 | IMPERVIOUS | 0.10 | 0.99 | 0.10 | 0.83 |
| | Lawn Area C | 0.05 | 0.51 | 0.03 | |
| | | | | | |
| | | | | | |
| | | 0.15 | | 0.12 | |
| A 5 | IMPERVIOUS | 0.17 | 0.99 | 0.17 | 0.88 |
| | Lawn Area C | 0.05 | 0.51 | 0.03 | |
| | | | | | |
| | | | | | |
| | | 0.22 | | 0.19 | |
| A 6 | IMPERVIOUS | 0.08 | 0.99 | 0.08 | 0.89 |
| | Lawn Area C | 0.02 | 0.51 | 0.01 | |
| | | | | | |
| | | | | | |
| | | 0.10 | | 0.09 | |
| A 7 | IMPERVIOUS | 0.07 | 0.99 | 0.07 | 0.82 |
| | Lawn Area C | 0.04 | 0.51 | 0.02 | |
| | | | | | |
| | | | | | |
| | | 0.11 | | 0.09 | |
| | | | | | |
| | | | | | |
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STORM SEWER DESIGN WORK SHEET

APPENDIX C
Pre-Development Calculations



PROJECT NAME: Rumson Road
PROJECT NUMBER: 15053.003
DESIGN BY: MK
CHECK BY:
DATE: 1-21-2021

PRE-DEVELOPMENT DRAINAGE AREA #1

DA #1

TOTAL AREA= 0.77 Acres

RUNOFF COEFFICIENT

| SURFACE TYPE | AREA, A (ACRES) | RUNOFF COEFF. (C) | A x C | COMPOSITE RUNOFF COEFF. C = (A x C)/ A |
|--------------|-----------------|-------------------|-------------|--|
| IMPERVIOUS | 0.28 | 0.99 | 0.28 | |
| LAWN 'C' | 0.35 | 0.51 | 0.18 | |
| LAWN 'D' | 0.08 | 0.65 | 0.05 | |
| WOODS 'C' | 0.06 | 0.59 | 0.04 | |
| | | | | |
| | 0.77 | | 0.54 | 0.71 |

RAINFALL INTENSITY CURVE - NOAA, 12 MIN.

2-YR. RUNOFF CALCULATION

i 2yr = 3.38 in/hr A = 0.77 acres C = 0.71

$$Q=CiA$$

$$Q \text{ 2yr} = 1.84 \text{ cfs}$$

10-YR. RUNOFF CALCULATION

i 10yr = 4.82 in/hr A = 0.77 acres C = 0.71

$$Q=CiA$$

$$Q \text{ 10yr} = 2.62 \text{ cfs}$$

25-YR. RUNOFF CALCULATION

i 25yr = 5.45 in/hr A = 0.77 acres C = 0.71

$$Q=CiA$$

$$Q \text{ 25yr} = 2.96 \text{ cfs}$$

100-YR. RUNOFF CALCULATION

i 100yr = 6.33 in/hr A = 0.77 acres C = 0.71

$$Q=CiA$$

$$Q \text{ 100yr} = 3.44 \text{ cfs}$$



NOAA Atlas 14, Volume 2, Version 3
Location name: Rumson, New Jersey, USA*
Latitude: 40.3617°, Longitude: -73.9938°
Elevation: 13.54 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

2-year 24 hour rainfall depth
 for time of concentration calculations
 using NEH Part 630

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerials](#)

PF tabular

| Duration | Average recurrence interval (years) | | | | | | | | | |
|----------|-------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | 1 | 2 | 5 | 10 | 25 | 50 | 100 | 200 | 500 | 1000 |
| 5-min | 0.342 (0.310-0.378) | 0.409 (0.370-0.452) | 0.484 (0.438-0.536) | 0.540 (0.488-0.597) | 0.609 (0.547-0.674) | 0.659 (0.589-0.728) | 0.713 (0.633-0.790) | 0.760 (0.670-0.845) | 0.821 (0.714-0.918) | 0.868 (0.748-0.975) |
| 10-min | 0.545 (0.494-0.603) | 0.653 (0.592-0.722) | 0.774 (0.701-0.857) | 0.864 (0.781-0.956) | 0.972 (0.873-1.08) | 1.05 (0.938-1.16) | 1.13 (1.00-1.25) | 1.20 (1.06-1.33) | 1.29 (1.13-1.45) | 1.36 (1.17-1.53) |
| 15-min | 0.682 (0.618-0.754) | 0.821 (0.743-0.907) | 0.978 (0.886-1.08) | 1.09 (0.984-1.21) | 1.23 (1.10-1.36) | 1.33 (1.19-1.47) | 1.43 (1.27-1.58) | 1.51 (1.33-1.68) | 1.63 (1.42-1.82) | 1.71 (1.47-1.92) |
| 30-min | 0.934 (0.846-1.03) | 1.13 (1.03-1.25) | 1.39 (1.26-1.54) | 1.58 (1.43-1.75) | 1.82 (1.63-2.01) | 2.00 (1.78-2.21) | 2.18 (1.93-2.41) | 2.35 (2.07-2.61) | 2.58 (2.25-2.89) | 2.76 (2.38-3.10) |
| 60-min | 1.16 (1.05-1.29) | 1.42 (1.29-1.57) | 1.78 (1.61-1.97) | 2.05 (1.85-2.27) | 2.42 (2.17-2.67) | 2.70 (2.41-2.99) | 2.99 (2.66-3.32) | 3.29 (2.90-3.66) | 3.70 (3.22-4.13) | 4.02 (3.46-4.51) |
| 2-hr | 1.44 (1.30-1.60) | 1.76 (1.59-1.95) | 2.23 (2.01-2.47) | 2.58 (2.32-2.87) | 3.08 (2.75-3.42) | 3.49 (3.10-3.87) | 3.91 (3.45-4.35) | 4.35 (3.80-4.85) | 4.96 (4.28-5.56) | 5.46 (4.67-6.15) |
| 3-hr | 1.60 (1.44-1.77) | 1.95 (1.76-2.17) | 2.47 (2.23-2.74) | 2.87 (2.59-3.19) | 3.44 (3.07-3.82) | 3.91 (3.47-4.34) | 4.39 (3.87-4.88) | 4.91 (4.28-5.46) | 5.63 (4.83-6.30) | 6.21 (5.27-7.00) |
| 6-hr | 2.03 (1.83-2.26) | 2.47 (2.23-2.75) | 3.11 (2.81-3.46) | 3.63 (3.26-4.03) | 4.38 (3.89-4.85) | 4.99 (4.41-5.53) | 5.65 (4.94-6.26) | 6.35 (5.50-7.06) | 7.36 (6.27-8.22) | 8.19 (6.89-9.19) |
| 12-hr | 2.48 (2.24-2.75) | 3.01 (2.72-3.34) | 3.81 (3.44-4.22) | 4.48 (4.02-4.96) | 5.46 (4.86-6.03) | 6.30 (5.56-6.95) | 7.20 (6.28-7.96) | 8.20 (7.05-9.08) | 9.66 (8.16-10.7) | 10.9 (9.07-12.2) |
| 24-hr | 2.81 (2.58-3.08) | 3.41 (3.13-3.74) | 4.40 (4.03-4.82) | 5.25 (4.79-5.73) | 6.52 (5.92-7.10) | 7.64 (6.88-8.30) | 8.89 (7.93-9.65) | 10.3 (9.08-11.2) | 12.4 (10.8-13.5) | 14.3 (12.2-15.5) |
| 2-day | 3.33 (3.05-3.68) | 4.04 (3.70-4.46) | 5.19 (4.74-5.73) | 6.17 (5.61-6.79) | 7.64 (6.89-8.40) | 8.90 (7.98-9.78) | 10.3 (9.17-11.3) | 11.9 (10.4-13.0) | 14.2 (12.3-15.6) | 16.2 (13.9-17.9) |
| 3-day | 3.51 (3.23-3.85) | 4.25 (3.91-4.66) | 5.45 (5.00-5.97) | 6.46 (5.91-7.06) | 7.95 (7.23-8.69) | 9.24 (8.35-10.1) | 10.7 (9.55-11.6) | 12.2 (10.8-13.4) | 14.6 (12.7-16.0) | 16.6 (14.3-18.2) |
| 4-day | 3.69 (3.41-4.02) | 4.47 (4.13-4.87) | 5.70 (5.26-6.21) | 6.74 (6.20-7.33) | 8.27 (7.57-8.98) | 9.58 (8.71-10.4) | 11.0 (9.93-12.0) | 12.6 (11.3-13.7) | 14.9 (13.2-16.3) | 16.9 (14.7-18.5) |
| 7-day | 4.26 (3.96-4.60) | 5.13 (4.76-5.54) | 6.44 (5.97-6.95) | 7.54 (6.97-8.13) | 9.14 (8.41-9.84) | 10.5 (9.59-11.3) | 11.9 (10.9-12.9) | 13.5 (12.2-14.6) | 15.9 (14.1-17.2) | 17.8 (15.6-19.4) |
| 10-day | 4.79 (4.47-5.13) | 5.74 (5.37-6.15) | 7.09 (6.63-7.61) | 8.21 (7.66-8.80) | 9.82 (9.11-10.5) | 11.2 (10.3-11.9) | 12.6 (11.5-13.5) | 14.1 (12.8-15.1) | 16.4 (14.7-17.6) | 18.3 (16.2-19.7) |
| 20-day | 6.48 (6.11-6.89) | 7.71 (7.26-8.19) | 9.26 (8.72-9.82) | 10.5 (9.87-11.1) | 12.2 (11.4-12.9) | 13.5 (12.6-14.3) | 14.9 (13.9-15.8) | 16.3 (15.1-17.3) | 18.2 (16.7-19.4) | 19.8 (18.0-21.1) |
| 30-day | 8.03 (7.63-8.48) | 9.51 (9.02-10.0) | 11.2 (10.6-11.8) | 12.6 (11.9-13.2) | 14.3 (13.5-15.1) | 15.7 (14.8-16.5) | 17.1 (16.0-18.0) | 18.4 (17.2-19.4) | 20.2 (18.8-21.4) | 21.6 (19.9-22.9) |
| 45-day | 10.2 (9.69-10.7) | 12.0 (11.4-12.6) | 14.0 (13.3-14.7) | 15.5 (14.7-16.2) | 17.4 (16.5-18.3) | 18.9 (17.9-19.8) | 20.3 (19.1-21.3) | 21.7 (20.4-22.8) | 23.4 (21.9-24.7) | 24.7 (23.0-26.2) |
| 60-day | 12.2 (11.6-12.8) | 14.3 (13.6-15.0) | 16.5 (15.7-17.3) | 18.1 (17.2-19.0) | 20.1 (19.1-21.1) | 21.6 (20.5-22.6) | 23.0 (21.7-24.1) | 24.3 (22.9-25.6) | 26.0 (24.4-27.4) | 27.1 (25.4-28.7) |

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



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| | | |
|-----------------|--|-----------------|
| PROJECT NUMBER: | 15053.003 | |
| PROJECT NAME: | Multi-Family Major Site plan for Rumson Road | |
| CALCULATED BY: | SP | DATE: 1/20/2021 |
| CHECKED BY: | | DATE: |
| REVISED BY: | | DATE: |

Sheet: 1 of 1

TIME OF CONCENTRATION CALCULATOR

| | | | |
|---------------------|----------------------------|-------------------------|----------|
| DRAINAGE AREA NAME: | Drainage Area 1 - Existing | DRAINAGE AREA NOTATION: | DA1 - Ex |
|---------------------|----------------------------|-------------------------|----------|

Sheet Flow:

Segment 1

| | | |
|---|----------------------------|---------|
| Surface Type: | Grass: Short-grass prairie | |
| Slope of land surface, S: | 0.020 | ft/ft |
| n-value (from Table 15-1): | 0.15 | --- |
| Limiting Length of flow, l: | 94.3 | ft |
| 2-year, 24 hours rainfall, P ₂ : | 3.410 | in |
| Travel time, T _t : | 9.1 | minutes |

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(nl)^{0.8}}{(P_2)^{0.5} S^{0.4}} \quad (\text{Eq 15-8})$$

Shallow Concentrated Flow:

Segment 2

| | | |
|-------------------------------|---------------------|---------|
| Surface Type: | Short-grass pasture | |
| Flow length, l: | 122 | ft |
| Slope of land surface, S: | 0.015 | ft/ft |
| n-value (from Table 15-3): | 0.073 | --- |
| Average velocity, V: | 0.853 | ft/s |
| Travel time, T _t : | 2.4 | minutes |

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{l}{3,600V} \quad (\text{Eq 15-1})$$

Shallow Concentrated Flow:

Segment 3

| | | |
|-------------------------------|-----------------------------------|---------|
| Surface Type: | Pavement and small upland gullies | |
| Flow length, l: | 106 | ft |
| Slope of land surface, S: | 0.015 | ft/ft |
| n-value (from Table 15-3): | 0.025 | --- |
| Average velocity, V: | 2.490 | ft/s |
| Travel time, T _t : | 0.7 | minutes |

| | | |
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| | | |
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| | | | |
|------------------------------|----|---------|------------|
| Total Time of Concentration: | 12 | minutes | user input |
|------------------------------|----|---------|------------|



PROJECT NAME: Rumson Road
PROJECT NUMBER: 15053.003
DESIGN BY: MK
CHECK BY:
DATE: 1-21-2021

PRE-DEVELOPMENT DRAINAGE AREA #2

DA #2

TOTAL AREA=

0.48 Acres

RUNOFF COEFFICIENT

| SURFACE TYPE | AREA, A (ACRES) | RUNOFF COEFF. (C) | A x C | COMPOSITE RUNOFF COEFF. C = (A x C)/ A |
|--------------|--------------------|----------------------|-------|---|
| IMPERVIOUS | 0.04 | 0.99 | 0.04 | |
| LAWN 'D' | 0.25 | 0.65 | 0.16 | |
| WOODS 'D' | 0.19 | 0.79 | 0.15 | |

0.48 0.35 0.73

RAINFALL INTENSITY CURVE - NOAA, 10 MIN.

2-YR. RUNOFF CALCULATION

i 2yr = 3.62 in/hr A = 0.48 acres C = 0.73

Q=CiA

Q 2yr = 1.27 cfs

10-YR. RUNOFF CALCULATION

i 10yr = 5.14 in/hr A = 0.48 acres C = 0.73

Q=CiA

Q 10yr = 1.81 cfs

25-YR. RUNOFF CALCULATION

i 25yr = 5.81 in/hr A = 0.48 acres C = 0.73

Q=CiA

Q 25yr = 2.05 cfs

100-YR. RUNOFF CALCULATION

i 100yr = 6.76 in/hr A = 0.48 acres C = 0.73

Q=CiA

Q 100yr= 2.38 cfs



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| | | |
|-----------------|--|-----------------|
| PROJECT NUMBER: | 15053.003 | |
| PROJECT NAME: | Multi-Family Major Site plan for Rumson Road | |
| CALCULATED BY: | SP | DATE: 1/20/2021 |
| CHECKED BY: | DATE: | |
| REVISED BY: | DATE: | |

Sheet: 1 of 1

TIME OF CONCENTRATION CALCULATOR

| | | | |
|---------------------|----------------------------|-------------------------|----------|
| DRAINAGE AREA NAME: | Drainage Area 2 - Existing | DRAINAGE AREA NOTATION: | DA2 - Ex |
|---------------------|----------------------------|-------------------------|----------|

Sheet Flow:

Segment 1

| | | |
|---|--|---------|
| Surface Type: | Smooth surface (concrete, asphalt, gravel, or bare soil) | |
| Slope of land surface, S: | 0.028 | ft/ft |
| n-value (from Table 15-1): | 0.011 | --- |
| Limiting Length of flow, l: | 82.0 | ft |
| 2-year, 24 hours rainfall, P ₂ : | 3.410 | in |
| Travel time, T _t : | 0.9 | minutes |

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(nl)^{0.8}}{(P_2)^{0.5} S^{0.4}} \quad (\text{Eq 15-8})$$

Sheet Flow:

Segment 2

| | | |
|---|----------------------------|---------|
| Surface Type: | Grass: Short-grass prairie | |
| Slope of land surface, S: | 0.006 | ft/ft |
| n-value (from Table 15-1): | 0.15 | --- |
| Limiting Length of flow, l: | 18.0 | ft |
| 2-year, 24 hours rainfall, P ₂ : | 3.410 | in |
| Travel time, T _t : | 3.9 | minutes |

Shallow Concentrated Flow:

Segment 3

| | | |
|-------------------------------|--|---------|
| Surface Type: | Minimum tillage cultivation, contour or strip-cropped, and woodlands | |
| Flow length, l: | 149 | ft |
| Slope of land surface, S: | 0.010 | ft/ft |
| n-value (from Table 15-3): | 0.101 | --- |
| Average velocity, V: | 0.503 | ft/s |
| Travel time, T _t : | 4.9 | minutes |

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{l}{3,600V} \quad (\text{Eq 15-1})$$

Total Time of Concentration:

10

minutes

user input



PROJECT NAME: Rumson Road
PROJECT NUMBER: 15053.003
DESIGN BY: MK
CHECK BY:
DATE: 1-21-2021

PRE-DEVELOPMENT DRAINAGE AREA #3

DA #3

TOTAL AREA=

3.23 Acres

RUNOFF COEFFICIENT

| SURFACE TYPE | AREA, A (ACRES) | RUNOFF COEFF. (C) | A x C | COMPOSITE RUNOFF COEFF. C = (A x C)/ A |
|--------------|--------------------|----------------------|-------------|---|
| IMPERVIOUS | 0.65 | 0.99 | 0.64 | |
| LAWN 'C' | 0.71 | 0.51 | 0.36 | |
| LAWN 'D' | 0.61 | 0.65 | 0.40 | |
| WOODS 'C' | 0.73 | 0.59 | 0.43 | |
| WOODS 'D' | 0.53 | 0.79 | 0.42 | |
| | 3.23 | | 2.25 | 0.70 |

RAINFALL INTENSITY CURVE - NOAA, 15 MIN.

2-YR. RUNOFF CALCULATION

i 2yr = 3.03 in/hr A = 3.23 acres C = 0.70

$$Q=CiA$$

$$Q \text{ 2yr} = 6.82 \text{ cfs}$$

10-YR. RUNOFF CALCULATION

i 10yr = 4.33 in/hr A = 3.23 acres C = 0.70

$$Q=CiA$$

$$Q \text{ 10yr} = 9.75 \text{ cfs}$$

25-YR. RUNOFF CALCULATION

i 25yr = 4.91 in/hr A = 3.23 acres C = 0.70

$$Q=CiA$$

$$Q \text{ 25yr} = 11.05 \text{ cfs}$$

100-YR. RUNOFF CALCULATION

i 100yr = 5.69 in/hr A = 3.23 acres C = 0.70

$$Q=CiA$$

$$Q \text{ 100yr} = 12.81 \text{ cfs}$$



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| | | |
|-----------------|--|-----------------|
| PROJECT NUMBER: | 15053.003 | |
| PROJECT NAME: | Multi-Family Major Site plan for Rumson Road | |
| CALCULATED BY: | SP | DATE: 1/20/2021 |
| CHECKED BY: | DATE: | |
| REVISED BY: | DATE: | |

Sheet: 1 of 1

TIME OF CONCENTRATION CALCULATOR

| | | | |
|---------------------|----------------------------|-------------------------|----------|
| DRAINAGE AREA NAME: | Drainage Area 3 - Existing | DRAINAGE AREA NOTATION: | DA3 - Ex |
|---------------------|----------------------------|-------------------------|----------|

Sheet Flow:

Segment 1

| | | |
|---|----------------------------|---------|
| Surface Type: | Grass: Short-grass prairie | |
| Slope of land surface, S: | 0.085 | ft/ft |
| n-value (from Table 15-1): | 0.15 | --- |
| Limiting Length of flow, l: | 100.0 | ft |
| 2-year, 24 hours rainfall, P ₂ : | 3.410 | in |
| Travel time, T _t : | 5.3 | minutes |

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(nl)^{0.8}}{(P_2)^{0.5} S^{0.4}} \quad (\text{Eq 15-8})$$

Shallow Concentrated Flow:

Segment 2

| | | |
|-------------------------------|---------------------|---------|
| Surface Type: | Short-grass pasture | |
| Flow length, l: | 76 | ft |
| Slope of land surface, S: | 0.016 | ft/ft |
| n-value (from Table 15-3): | 0.073 | --- |
| Average velocity, V: | 0.881 | ft/s |
| Travel time, T _t : | 1.4 | minutes |

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{l}{3,600V} \quad (\text{Eq 15-1})$$

Shallow Concentrated Flow:

Segment 3

| | | |
|-------------------------------|--|---------|
| Surface Type: | Minimum tillage cultivation, contour or strip-cropped, and woodlands | |
| Flow length, l: | 262 | ft |
| Slope of land surface, S: | 0.010 | ft/ft |
| n-value (from Table 15-3): | 3 | --- |
| Average velocity, V: | 0.503 | ft/s |
| Travel time, T _t : | 8.7 | minutes |

| | | | |
|------------------------------|----|---------|------------|
| Total Time of Concentration: | 15 | minutes | user input |
|------------------------------|----|---------|------------|



PROJECT NAME: Rumson Road
PROJECT NUMBER: 15053.003
DESIGN BY: MK
CHECK BY:
DATE: 1-21-2021

PRE-DEVELOPMENT DRAINAGE AREA #4

DA #4

TOTAL AREA=

1.32 Acres

RUNOFF COEFFICIENT

| SURFACE TYPE | AREA, A (ACRES) | RUNOFF COEFF. (C) | A x C | COMPOSITE RUNOFF COEFF. C = (A x C)/ A |
|--------------|--------------------|----------------------|-------------|---|
| IMPERVIOUS | 0.07 | 0.99 | 0.07 | |
| LAWN 'C' | 0.16 | 0.51 | 0.08 | |
| LAWN 'D' | 0.08 | 0.65 | 0.05 | |
| WOODS 'C' | 0.70 | 0.59 | 0.41 | |
| WOODS 'D' | 0.31 | 0.79 | 0.24 | |
| | 1.32 | | 0.86 | 0.65 |

RAINFALL INTENSITY CURVE - NOAA, 18 MIN.

2-YR. RUNOFF CALCULATION

i 2yr = 2.84 in/hr A = 1.32 acres C = 0.65

$$Q=CiA$$

$$Q \text{ 2yr} = 2.44 \text{ cfs}$$

10-YR. RUNOFF CALCULATION

i 10yr = 4.09 in/hr A = 1.32 acres C = 0.65

$$Q=CiA$$

$$Q \text{ 10yr} = 3.52 \text{ cfs}$$

25-YR. RUNOFF CALCULATION

i 25yr = 4.62 in/hr A = 1.32 acres C = 0.65

$$Q=CiA$$

$$Q \text{ 25yr} = 3.98 \text{ cfs}$$

100-YR. RUNOFF CALCULATION

i 100yr = 5.42 in/hr A = 1.32 acres C = 0.65

$$Q=CiA$$

$$Q \text{ 100yr} = 4.67 \text{ cfs}$$



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| | | |
|-----------------|--|-----------------|
| PROJECT NUMBER: | 15053.003 | |
| PROJECT NAME: | Multi-Family Major Site plan for Rumson Road | |
| CALCULATED BY: | SP | DATE: 1/20/2021 |
| CHECKED BY: | | DATE: |
| REVISED BY: | | DATE: |

Sheet: 1 of 1

TIME OF CONCENTRATION CALCULATOR

| | | | |
|---------------------|----------------------------|-------------------------|----------|
| DRAINAGE AREA NAME: | Drainage Area 4 - Existing | DRAINAGE AREA NOTATION: | DA4 - Ex |
|---------------------|----------------------------|-------------------------|----------|

Sheet Flow:

Segment 1

| | | |
|---|-------------------------|---------|
| Surface Type: | Woods: Light underbrush | |
| Slope of land surface, S: | 0.025 | ft/ft |
| n-value (from Table 15-1): | 0.4 | --- |
| Limiting Length of flow, l: | 39.5 | ft |
| 2-year, 24 hours rainfall, P ₂ : | 3.410 | in |
| Travel time, T _t : | 9.1 | minutes |

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(nl)^{0.8}}{(P_2)^{0.5} S^{0.4}} \quad (\text{Eq 15-8})$$

Shallow Concentrated Flow:

Segment 2

| | | |
|-------------------------------|--|---------|
| Surface Type: | Minimum tillage cultivation, contour or strip-cropped, and woodlands | |
| Flow length, l: | 311 | ft |
| Slope of land surface, S: | 0.013 | ft/ft |
| n-value (from Table 15-3): | 0.101 | --- |
| Average velocity, V: | 0.574 | ft/s |
| Travel time, T _t : | 9.0 | minutes |

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{l}{3,600V} \quad (\text{Eq 15-1})$$

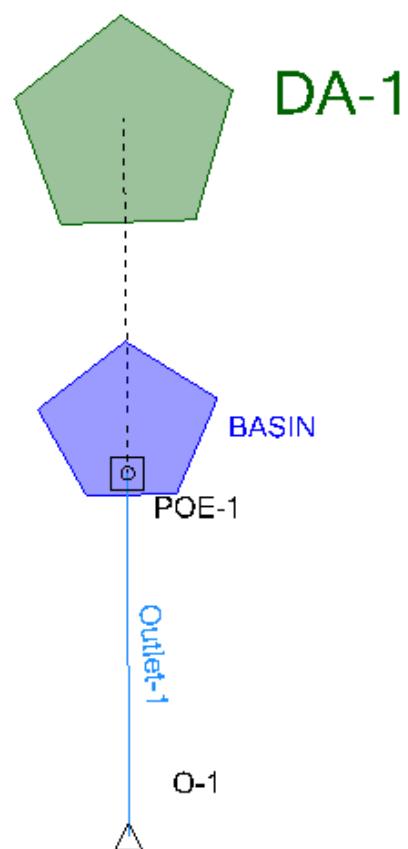
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|------------------------------|----|---------|------------|
| Total Time of Concentration: | 18 | minutes | user input |
|------------------------------|----|---------|------------|

APPENDIX D
Post Development Calculations

POST-DEVELOPMENT DRAINAGE AREA 1



UNDERGROUND DETENTION SYSTEM CAPACITY

30" StormTank Modules

Trench Area = 3543.00

Total Volume = 3543 SF x 2.5 ft x 0.965* = 8547.49

| Elevation | Depth | Total Volume cu. ft. |
|-----------|-------|-------------------------|
| 11.30 | 0.00 | 0.00 |
| 11.55 | 0.25 | 854.75 |
| 11.80 | 0.50 | 1709.50 |
| 12.05 | 0.75 | 2564.25 |
| 12.30 | 1.00 | 3419.00 |
| 12.55 | 1.25 | 4273.74 |
| 12.80 | 1.50 | 5128.49 |
| 13.05 | 1.75 | 5983.24 |
| 13.30 | 2.00 | 6837.99 |
| 13.55 | 2.25 | 7692.74 |
| 13.80 | 2.50 | 8547.49 |
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* Porosity of 30" Stormtank Module = 96.5%

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Subsection: Modified Rational Grand Summary

Modified Rational Method

$$Q = CiA * \text{Units Conversion}; \text{ Where conversion} = 43560 / (12 * 3600)$$

| Frequency (years) | Area (acres) | Adjusted C Coefficient | Duration (min) | Intensity (in/h) | Flow (Peak) (ft³/s) | Flow (Allowable) (ft³/s) | Volume (inflow) (ft³) | Volume (Storage) (ft³) |
|----------------------|-----------------|---------------------------|-------------------|---------------------|---------------------------|--------------------------------|-----------------------------|------------------------------|
| 100 | 1.350 | 0.922 | 39.000 | 3.935 | 4.94 | 2.75 | 11,551.56 8 | 5,240.353 |
| 10 | 1.350 | 0.922 | 37.000 | 2.873 | 3.60 | 1.97 | 8,002.383 | 3,718.312 |
| 2 | 1.350 | 0.922 | 41.000 | 1.804 | 2.26 | 0.92 | 5,567.395 | 3,338.002 |

Subsection: Master Network Summary

Catchments Summary

| Label | Scenario | Return Event (years) | Hydrograph Volume (ft³) | Time to Peak (min) | Peak Flow (ft³/s) |
|-------|----------|----------------------|-------------------------|--------------------|-------------------|
| DA-1 | 2 year | 2 | 5,566.000 | 5.400 | 2.26 |
| DA-1 | 10 year | 10 | 7,999.000 | 5.400 | 3.60 |
| DA-1 | 100 year | 100 | 11,552.000 | 5.400 | 4.94 |

Node Summary

| Label | Scenario | Return Event (years) | Hydrograph Volume (ft³) | Time to Peak (min) | Peak Flow (ft³/s) |
|-------|----------|----------------------|-------------------------|--------------------|-------------------|
| O-1 | 2 year | 2 | 5,566.000 | 44.400 | 0.85 |
| O-1 | 10 year | 10 | 7,999.000 | 40.200 | 1.28 |
| O-1 | 100 year | 100 | 11,552.000 | 41.400 | 2.70 |

Pond Summary

| Label | Scenario | Return Event (years) | Hydrograph Volume (ft³) | Time to Peak (min) | Peak Flow (ft³/s) | Maximum Water Surface Elevation (ft) | Maximum Pond Storage (ft³) |
|-------------|----------|----------------------|-------------------------|--------------------|-------------------|--------------------------------------|----------------------------|
| BASIN (IN) | 2 year | 2 | 5,566.000 | 5.400 | 2.26 | (N/A) | (N/A) |
| BASIN (OUT) | 2 year | 2 | 5,566.000 | 44.400 | 0.85 | 12.48 | 4,038.000 |
| BASIN (IN) | 10 year | 10 | 7,999.000 | 5.400 | 3.60 | (N/A) | (N/A) |
| BASIN (OUT) | 10 year | 10 | 7,999.000 | 40.200 | 1.28 | 13.11 | 6,205.000 |
| BASIN (IN) | 100 year | 100 | 11,552.000 | 5.400 | 4.94 | (N/A) | (N/A) |
| BASIN (OUT) | 100 year | 100 | 11,552.000 | 41.400 | 2.70 | 13.79 | 8,505.000 |

Subsection: I-D-F Table
Label: Rumson - 1
Scenario: 10 year

Return Event: 10 years
Storm Event: Rumson - 1 - 10 Year

I-D-F Curve

| Time (min) | Intensity (in/h) |
|---------------|---------------------|
| 5.000 | 6.430 |
| 10.000 | 5.140 |
| 15.000 | 4.330 |
| 30.000 | 3.130 |
| 60.000 | 2.030 |
| 120.000 | 1.280 |
| 180.000 | 0.948 |
| 360.000 | 0.601 |
| 720.000 | 0.368 |
| 1,440.000 | 0.216 |

Subsection: I-D-F Table
Label: Rumson - 1
Scenario: 100 year

Return Event: 100 years
Storm Event: Rumson - 1 - 100 Year

I-D-F Curve

| Time (min) | Intensity (in/h) |
|---------------|---------------------|
| 5.000 | 8.530 |
| 10.000 | 6.760 |
| 15.000 | 5.690 |
| 30.000 | 4.340 |
| 60.000 | 2.990 |
| 120.000 | 1.950 |
| 180.000 | 1.460 |
| 360.000 | 0.939 |
| 720.000 | 0.594 |
| 1,440.000 | 0.366 |

Subsection: I-D-F Table
Label: Rumson - 1
Scenario: 2 year

Return Event: 2 years
Storm Event: Rumson - 1 - 2 Year

I-D-F Curve

| Time (min) | Intensity (in/h) |
|---------------|---------------------|
| 5.000 | 4.540 |
| 10.000 | 3.620 |
| 15.000 | 3.030 |
| 30.000 | 2.090 |
| 60.000 | 1.310 |
| 120.000 | 0.813 |
| 180.000 | 0.598 |
| 360.000 | 0.381 |
| 720.000 | 0.230 |
| 1,440.000 | 0.130 |

Subsection: Time vs. Elevation
 Label: BASIN (OUT)
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 0.000 | 11.10 | 11.30 | 11.31 | 11.33 | 11.35 |
| 3.000 | 11.37 | 11.41 | 11.44 | 11.49 | 11.54 |
| 6.000 | 11.58 | 11.63 | 11.68 | 11.73 | 11.77 |
| 9.000 | 11.82 | 11.86 | 11.91 | 11.96 | 12.00 |
| 12.000 | 12.05 | 12.09 | 12.14 | 12.18 | 12.22 |
| 15.000 | 12.27 | 12.31 | 12.35 | 12.40 | 12.44 |
| 18.000 | 12.48 | 12.53 | 12.57 | 12.61 | 12.66 |
| 21.000 | 12.70 | 12.74 | 12.78 | 12.82 | 12.87 |
| 24.000 | 12.91 | 12.95 | 12.99 | 13.03 | 13.07 |
| 27.000 | 13.11 | 13.14 | 13.18 | 13.22 | 13.26 |
| 30.000 | 13.29 | 13.33 | 13.36 | 13.39 | 13.43 |
| 33.000 | 13.46 | 13.49 | 13.52 | 13.55 | 13.58 |
| 36.000 | 13.61 | 13.64 | 13.66 | 13.69 | 13.72 |
| 39.000 | 13.74 | 13.76 | 13.78 | 13.79 | 13.79 |
| 42.000 | 13.78 | 13.77 | 13.76 | 13.73 | 13.71 |
| 45.000 | 13.68 | 13.66 | 13.63 | 13.61 | 13.59 |
| 48.000 | 13.56 | 13.54 | 13.52 | 13.50 | 13.48 |
| 51.000 | 13.46 | 13.44 | 13.42 | 13.40 | 13.38 |
| 54.000 | 13.36 | 13.34 | 13.32 | 13.31 | 13.29 |
| 57.000 | 13.27 | 13.26 | 13.24 | 13.23 | 13.21 |
| 60.000 | 13.20 | 13.18 | 13.17 | 13.15 | 13.14 |
| 63.000 | 13.13 | 13.11 | 13.10 | 13.09 | 13.07 |
| 66.000 | 13.06 | 13.05 | 13.03 | 13.02 | 13.01 |
| 69.000 | 13.00 | 12.99 | 12.98 | 12.96 | 12.95 |
| 72.000 | 12.94 | 12.93 | 12.92 | 12.91 | 12.90 |
| 75.000 | 12.89 | 12.88 | 12.87 | 12.86 | 12.85 |
| 78.000 | 12.84 | 12.82 | 12.81 | 12.80 | 12.79 |
| 81.000 | 12.78 | 12.77 | 12.76 | 12.75 | 12.74 |
| 84.000 | 12.73 | 12.72 | 12.71 | 12.70 | 12.69 |
| 87.000 | 12.69 | 12.68 | 12.67 | 12.66 | 12.65 |
| 90.000 | 12.64 | 12.63 | 12.62 | 12.61 | 12.60 |
| 93.000 | 12.59 | 12.58 | 12.57 | 12.56 | 12.55 |
| 96.000 | 12.54 | 12.53 | 12.52 | 12.52 | 12.51 |
| 99.000 | 12.50 | 12.49 | 12.48 | 12.47 | 12.46 |
| 102.000 | 12.45 | 12.44 | 12.43 | 12.43 | 12.42 |
| 105.000 | 12.41 | 12.40 | 12.39 | 12.38 | 12.37 |
| 108.000 | 12.37 | 12.36 | 12.35 | 12.34 | 12.33 |
| 111.000 | 12.32 | 12.32 | 12.31 | 12.30 | 12.29 |
| 114.000 | 12.28 | 12.27 | 12.27 | 12.26 | 12.25 |
| 117.000 | 12.24 | 12.23 | 12.23 | 12.22 | 12.21 |
| 120.000 | 12.20 | 12.19 | 12.19 | 12.18 | 12.17 |
| 123.000 | 12.16 | 12.16 | 12.15 | 12.14 | 12.13 |

Subsection: Time vs. Elevation
 Label: BASIN (OUT)
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 126.000 | 12.13 | 12.12 | 12.11 | 12.10 | 12.10 |
| 129.000 | 12.09 | 12.08 | 12.07 | 12.07 | 12.06 |
| 132.000 | 12.05 | 12.05 | 12.04 | 12.03 | 12.03 |
| 135.000 | 12.02 | 12.01 | 12.00 | 12.00 | 11.99 |
| 138.000 | 11.98 | 11.98 | 11.97 | 11.96 | 11.96 |
| 141.000 | 11.95 | 11.94 | 11.94 | 11.93 | 11.92 |
| 144.000 | 11.92 | 11.91 | 11.91 | 11.90 | 11.89 |
| 147.000 | 11.89 | 11.88 | 11.87 | 11.87 | 11.86 |
| 150.000 | 11.86 | 11.85 | 11.84 | 11.84 | 11.83 |
| 153.000 | 11.83 | 11.82 | 11.81 | 11.81 | 11.80 |
| 156.000 | 11.80 | 11.79 | 11.79 | 11.78 | 11.77 |
| 159.000 | 11.77 | 11.76 | 11.76 | 11.75 | 11.75 |
| 162.000 | 11.74 | 11.74 | 11.73 | 11.73 | 11.72 |
| 165.000 | 11.72 | 11.71 | 11.70 | 11.70 | 11.69 |
| 168.000 | 11.69 | 11.68 | 11.68 | 11.67 | 11.67 |
| 171.000 | 11.66 | 11.66 | 11.66 | 11.65 | 11.65 |
| 174.000 | 11.64 | 11.64 | 11.63 | 11.63 | 11.62 |
| 177.000 | 11.62 | 11.61 | 11.61 | 11.61 | 11.60 |
| 180.000 | 11.60 | 11.59 | 11.59 | 11.58 | 11.58 |
| 183.000 | 11.58 | 11.57 | 11.57 | 11.56 | 11.56 |
| 186.000 | 11.56 | 11.55 | 11.55 | 11.54 | 11.54 |
| 189.000 | 11.54 | 11.53 | 11.53 | 11.53 | 11.52 |
| 192.000 | 11.52 | 11.52 | 11.51 | 11.51 | 11.51 |
| 195.000 | 11.50 | 11.50 | 11.50 | 11.49 | 11.49 |
| 198.000 | 11.49 | 11.49 | 11.48 | 11.48 | 11.48 |
| 201.000 | 11.47 | 11.47 | 11.47 | 11.47 | 11.46 |
| 204.000 | 11.46 | 11.46 | 11.46 | 11.45 | 11.45 |
| 207.000 | 11.45 | 11.45 | 11.44 | 11.44 | 11.44 |
| 210.000 | 11.44 | 11.43 | 11.43 | 11.43 | 11.43 |
| 213.000 | 11.42 | 11.42 | 11.42 | 11.42 | 11.42 |
| 216.000 | 11.41 | 11.41 | 11.41 | 11.41 | 11.41 |
| 219.000 | 11.40 | 11.40 | 11.40 | 11.40 | 11.40 |
| 222.000 | 11.40 | 11.39 | 11.39 | 11.39 | 11.39 |
| 225.000 | 11.39 | 11.38 | 11.38 | 11.38 | 11.38 |
| 228.000 | 11.38 | 11.38 | 11.37 | 11.37 | 11.37 |
| 231.000 | 11.37 | 11.37 | 11.37 | 11.36 | 11.36 |
| 234.000 | 11.36 | 11.36 | 11.36 | 11.36 | 11.36 |
| 237.000 | 11.35 | 11.35 | 11.35 | 11.35 | 11.35 |
| 240.000 | 11.35 | 11.35 | 11.34 | 11.34 | 11.34 |
| 243.000 | 11.34 | 11.34 | 11.34 | 11.34 | 11.34 |
| 246.000 | 11.33 | 11.33 | 11.33 | 11.33 | 11.33 |
| 249.000 | 11.33 | 11.33 | 11.33 | 11.33 | 11.32 |

Subsection: Time vs. Elevation
 Label: BASIN (OUT)
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 252.000 | 11.32 | 11.32 | 11.32 | 11.32 | 11.32 |
| 255.000 | 11.32 | 11.32 | 11.32 | 11.31 | 11.31 |
| 258.000 | 11.31 | 11.31 | 11.31 | 11.31 | 11.31 |
| 261.000 | 11.31 | 11.31 | 11.31 | 11.30 | 11.30 |
| 264.000 | 11.30 | 11.30 | 11.30 | 11.22 | 11.10 |
| 267.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 270.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 273.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 276.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 279.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 282.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 285.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 288.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 291.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 294.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 297.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 300.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 303.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 306.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 309.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 312.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 315.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 318.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 321.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 324.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 327.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 330.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 333.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 336.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 339.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 342.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 345.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 348.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 351.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 354.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 357.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 360.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 363.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 366.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 369.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 372.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 375.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |

Subsection: Time vs. Elevation
 Label: BASIN (OUT)
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 378.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 381.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 384.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 387.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 390.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 393.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 396.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 399.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 402.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 405.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 408.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 411.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 414.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 417.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 420.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 423.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 426.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 429.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 432.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 435.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 438.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 441.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 444.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 447.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 450.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 453.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 456.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 459.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 462.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 465.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 468.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 471.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 474.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 477.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 480.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 483.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 486.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 489.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 492.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 495.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 498.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 501.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |

Subsection: Time vs. Elevation
 Label: BASIN (OUT)
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 504.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 507.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 510.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 513.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 516.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 519.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 522.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 525.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 528.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 531.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 534.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 537.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 540.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 543.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 546.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 549.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 552.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 555.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 558.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 561.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 564.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 567.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 570.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 573.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 576.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 579.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 582.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 585.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 588.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 591.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 594.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 597.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 600.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 603.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 606.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 609.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 612.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 615.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 618.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 621.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 624.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 627.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |

Subsection: Time vs. Elevation
 Label: BASIN (OUT)
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 630.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 633.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 636.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 639.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 642.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 645.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 648.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 651.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 654.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 657.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 660.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 663.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 666.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 669.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 672.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 675.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 678.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 681.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 684.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 687.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 690.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 693.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 696.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 699.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 702.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 705.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 708.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 711.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 714.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 717.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 720.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 723.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 726.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 729.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 732.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 735.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 738.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 741.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 744.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 747.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 750.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 753.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |

Subsection: Time vs. Elevation
 Label: BASIN (OUT)
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 756.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 759.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 762.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 765.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 768.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 771.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 774.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 777.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 780.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 783.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 786.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 789.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 792.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 795.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 798.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 801.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 804.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 807.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 810.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 813.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 816.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 819.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 822.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 825.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 828.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 831.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 834.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 837.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 840.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 843.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 846.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 849.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 852.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 855.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 858.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 861.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 864.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 867.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 870.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 873.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 876.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 879.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |

Subsection: Time vs. Elevation
 Label: BASIN (OUT)
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 882.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 885.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 888.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 891.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 894.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 897.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 900.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 903.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 906.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 909.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 912.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 915.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 918.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 921.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 924.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 927.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 930.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 933.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 936.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 939.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 942.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 945.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 948.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 951.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 954.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 957.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 960.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 963.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 966.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 969.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 972.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 975.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 978.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 981.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 984.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 987.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 990.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 993.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 996.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 999.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,002.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,005.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |

Subsection: Time vs. Elevation
 Label: BASIN (OUT)
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 1,008.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,011.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,014.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,017.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,020.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,023.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,026.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,029.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,032.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,035.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,038.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,041.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,044.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,047.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,050.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,053.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,056.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,059.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,062.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,065.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,068.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,071.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,074.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,077.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,080.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,083.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,086.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,089.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,092.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,095.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,098.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,101.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,104.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,107.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,110.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,113.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,116.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,119.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,122.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,125.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,128.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,131.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |

Subsection: Time vs. Elevation
 Label: BASIN (OUT)
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 1,134.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,137.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,140.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,143.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,146.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,149.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,152.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,155.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,158.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,161.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,164.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,167.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,170.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,173.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,176.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,179.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,182.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,185.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,188.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,191.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,194.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,197.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,200.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,203.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,206.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,209.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,212.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,215.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,218.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,221.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,224.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,227.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,230.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,233.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,236.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,239.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,242.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,245.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,248.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,251.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,254.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,257.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |

Subsection: Time vs. Elevation
 Label: BASIN (OUT)
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 1,260.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,263.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,266.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,269.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,272.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,275.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,278.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,281.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,284.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,287.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,290.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,293.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,296.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,299.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,302.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,305.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,308.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,311.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,314.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,317.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,320.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,323.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,326.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,329.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,332.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,335.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,338.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,341.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,344.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,347.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,350.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,353.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,356.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,359.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,362.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,365.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,368.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,371.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,374.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,377.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,380.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,383.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |

Subsection: Time vs. Elevation
Label: BASIN (OUT)
Scenario: 100 year

Return Event: 100 years
Storm Event: Rumson - 1 - 100 Year

Time vs. Elevation (ft)

Output Time increment = 0.600 min

Time on left represents time for first value in each row.

| Time (min) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) | Elevation (ft) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 1,386.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,389.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,392.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,395.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,398.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,401.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,404.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,407.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,410.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,413.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,416.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,419.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,422.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,425.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,428.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,431.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,434.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,437.000 | 11.10 | 11.10 | 11.10 | 11.10 | 11.10 |
| 1,440.000 | 11.10 | (N/A) | (N/A) | (N/A) | (N/A) |

Subsection: Time vs. Volume
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 0.000 | 0.000 | 9.000 | 38.000 | 87.000 | 158.000 |
| 3.000 | 249.000 | 360.000 | 491.000 | 642.000 | 805.000 |
| 6.000 | 970.000 | 1,132.000 | 1,294.000 | 1,454.000 | 1,613.000 |
| 9.000 | 1,772.000 | 1,929.000 | 2,085.000 | 2,241.000 | 2,396.000 |
| 12.000 | 2,549.000 | 2,703.000 | 2,855.000 | 3,007.000 | 3,158.000 |
| 15.000 | 3,308.000 | 3,458.000 | 3,607.000 | 3,755.000 | 3,903.000 |
| 18.000 | 4,051.000 | 4,197.000 | 4,343.000 | 4,489.000 | 4,634.000 |
| 21.000 | 4,779.000 | 4,923.000 | 5,066.000 | 5,209.000 | 5,352.000 |
| 24.000 | 5,493.000 | 5,633.000 | 5,772.000 | 5,909.000 | 6,044.000 |
| 27.000 | 6,177.000 | 6,308.000 | 6,437.000 | 6,563.000 | 6,688.000 |
| 30.000 | 6,809.000 | 6,929.000 | 7,046.000 | 7,161.000 | 7,273.000 |
| 33.000 | 7,383.000 | 7,490.000 | 7,595.000 | 7,697.000 | 7,797.000 |
| 36.000 | 7,895.000 | 7,990.000 | 8,083.000 | 8,174.000 | 8,262.000 |
| 39.000 | 8,348.000 | 8,421.000 | 8,471.000 | 8,499.000 | 8,505.000 |
| 42.000 | 8,490.000 | 8,454.000 | 8,398.000 | 8,322.000 | 8,235.000 |
| 45.000 | 8,146.000 | 8,060.000 | 7,975.000 | 7,893.000 | 7,813.000 |
| 48.000 | 7,734.000 | 7,658.000 | 7,583.000 | 7,510.000 | 7,439.000 |
| 51.000 | 7,369.000 | 7,301.000 | 7,235.000 | 7,169.000 | 7,106.000 |
| 54.000 | 7,043.000 | 6,982.000 | 6,922.000 | 6,864.000 | 6,806.000 |
| 57.000 | 6,750.000 | 6,694.000 | 6,640.000 | 6,587.000 | 6,535.000 |
| 60.000 | 6,483.000 | 6,433.000 | 6,383.000 | 6,335.000 | 6,287.000 |
| 63.000 | 6,240.000 | 6,193.000 | 6,148.000 | 6,103.000 | 6,059.000 |
| 66.000 | 6,015.000 | 5,972.000 | 5,930.000 | 5,888.000 | 5,847.000 |
| 69.000 | 5,807.000 | 5,767.000 | 5,727.000 | 5,688.000 | 5,649.000 |
| 72.000 | 5,611.000 | 5,573.000 | 5,536.000 | 5,499.000 | 5,462.000 |
| 75.000 | 5,426.000 | 5,390.000 | 5,354.000 | 5,319.000 | 5,283.000 |
| 78.000 | 5,248.000 | 5,213.000 | 5,178.000 | 5,143.000 | 5,109.000 |
| 81.000 | 5,074.000 | 5,040.000 | 5,006.000 | 4,971.000 | 4,937.000 |
| 84.000 | 4,903.000 | 4,870.000 | 4,836.000 | 4,802.000 | 4,769.000 |
| 87.000 | 4,735.000 | 4,702.000 | 4,669.000 | 4,636.000 | 4,603.000 |
| 90.000 | 4,571.000 | 4,538.000 | 4,505.000 | 4,473.000 | 4,441.000 |
| 93.000 | 4,409.000 | 4,377.000 | 4,345.000 | 4,313.000 | 4,281.000 |
| 96.000 | 4,250.000 | 4,218.000 | 4,187.000 | 4,156.000 | 4,125.000 |
| 99.000 | 4,094.000 | 4,063.000 | 4,032.000 | 4,002.000 | 3,971.000 |
| 102.000 | 3,941.000 | 3,910.000 | 3,880.000 | 3,850.000 | 3,821.000 |
| 105.000 | 3,791.000 | 3,761.000 | 3,732.000 | 3,702.000 | 3,673.000 |
| 108.000 | 3,644.000 | 3,615.000 | 3,586.000 | 3,557.000 | 3,528.000 |
| 111.000 | 3,500.000 | 3,471.000 | 3,443.000 | 3,415.000 | 3,387.000 |
| 114.000 | 3,359.000 | 3,331.000 | 3,303.000 | 3,276.000 | 3,248.000 |
| 117.000 | 3,221.000 | 3,193.000 | 3,166.000 | 3,139.000 | 3,112.000 |
| 120.000 | 3,086.000 | 3,059.000 | 3,032.000 | 3,006.000 | 2,980.000 |
| 123.000 | 2,954.000 | 2,928.000 | 2,902.000 | 2,876.000 | 2,850.000 |

Subsection: Time vs. Volume
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 126.000 | 2,825.000 | 2,799.000 | 2,774.000 | 2,749.000 | 2,723.000 |
| 129.000 | 2,698.000 | 2,674.000 | 2,649.000 | 2,624.000 | 2,600.000 |
| 132.000 | 2,575.000 | 2,551.000 | 2,527.000 | 2,503.000 | 2,479.000 |
| 135.000 | 2,455.000 | 2,432.000 | 2,408.000 | 2,385.000 | 2,361.000 |
| 138.000 | 2,338.000 | 2,315.000 | 2,292.000 | 2,269.000 | 2,247.000 |
| 141.000 | 2,224.000 | 2,202.000 | 2,179.000 | 2,157.000 | 2,135.000 |
| 144.000 | 2,113.000 | 2,091.000 | 2,069.000 | 2,048.000 | 2,026.000 |
| 147.000 | 2,005.000 | 1,984.000 | 1,962.000 | 1,941.000 | 1,921.000 |
| 150.000 | 1,900.000 | 1,879.000 | 1,859.000 | 1,838.000 | 1,818.000 |
| 153.000 | 1,798.000 | 1,778.000 | 1,758.000 | 1,738.000 | 1,718.000 |
| 156.000 | 1,698.000 | 1,679.000 | 1,660.000 | 1,640.000 | 1,621.000 |
| 159.000 | 1,602.000 | 1,583.000 | 1,565.000 | 1,546.000 | 1,528.000 |
| 162.000 | 1,509.000 | 1,491.000 | 1,473.000 | 1,455.000 | 1,437.000 |
| 165.000 | 1,419.000 | 1,401.000 | 1,384.000 | 1,366.000 | 1,349.000 |
| 168.000 | 1,332.000 | 1,315.000 | 1,298.000 | 1,281.000 | 1,264.000 |
| 171.000 | 1,248.000 | 1,231.000 | 1,215.000 | 1,199.000 | 1,183.000 |
| 174.000 | 1,167.000 | 1,151.000 | 1,135.000 | 1,119.000 | 1,104.000 |
| 177.000 | 1,088.000 | 1,073.000 | 1,058.000 | 1,043.000 | 1,028.000 |
| 180.000 | 1,013.000 | 999.000 | 984.000 | 970.000 | 956.000 |
| 183.000 | 942.000 | 928.000 | 914.000 | 901.000 | 888.000 |
| 186.000 | 875.000 | 862.000 | 849.000 | 837.000 | 824.000 |
| 189.000 | 812.000 | 800.000 | 788.000 | 776.000 | 764.000 |
| 192.000 | 753.000 | 741.000 | 730.000 | 719.000 | 708.000 |
| 195.000 | 697.000 | 687.000 | 676.000 | 666.000 | 655.000 |
| 198.000 | 645.000 | 635.000 | 625.000 | 615.000 | 606.000 |
| 201.000 | 596.000 | 587.000 | 577.000 | 568.000 | 559.000 |
| 204.000 | 550.000 | 541.000 | 532.000 | 524.000 | 515.000 |
| 207.000 | 507.000 | 498.000 | 490.000 | 482.000 | 474.000 |
| 210.000 | 466.000 | 458.000 | 450.000 | 442.000 | 435.000 |
| 213.000 | 427.000 | 420.000 | 412.000 | 405.000 | 398.000 |
| 216.000 | 391.000 | 384.000 | 377.000 | 370.000 | 364.000 |
| 219.000 | 357.000 | 350.000 | 344.000 | 338.000 | 331.000 |
| 222.000 | 325.000 | 319.000 | 313.000 | 306.000 | 300.000 |
| 225.000 | 294.000 | 289.000 | 283.000 | 277.000 | 271.000 |
| 228.000 | 265.000 | 260.000 | 254.000 | 249.000 | 243.000 |
| 231.000 | 238.000 | 232.000 | 227.000 | 222.000 | 217.000 |
| 234.000 | 212.000 | 206.000 | 201.000 | 196.000 | 191.000 |
| 237.000 | 187.000 | 182.000 | 177.000 | 172.000 | 167.000 |
| 240.000 | 163.000 | 158.000 | 153.000 | 149.000 | 144.000 |
| 243.000 | 140.000 | 136.000 | 131.000 | 127.000 | 123.000 |
| 246.000 | 118.000 | 114.000 | 110.000 | 106.000 | 102.000 |
| 249.000 | 98.000 | 94.000 | 90.000 | 86.000 | 82.000 |

Subsection: Time vs. Volume
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 252.000 | 78.000 | 74.000 | 71.000 | 67.000 | 63.000 |
| 255.000 | 60.000 | 56.000 | 52.000 | 49.000 | 45.000 |
| 258.000 | 42.000 | 38.000 | 35.000 | 32.000 | 28.000 |
| 261.000 | 25.000 | 22.000 | 19.000 | 15.000 | 12.000 |
| 264.000 | 9.000 | 6.000 | 3.000 | 0.000 | 0.000 |
| 267.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 270.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 273.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 276.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 279.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 282.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 285.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 288.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 291.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 294.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 297.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 300.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 303.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 306.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 309.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 312.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 315.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 318.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 321.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 324.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 327.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 330.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 333.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 336.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 339.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 342.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 345.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 348.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 351.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 354.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 357.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 360.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 363.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 366.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 369.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 372.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 375.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Subsection: Time vs. Volume
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 378.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 381.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 384.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 387.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 390.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 393.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 396.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 399.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 402.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 405.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 408.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 411.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 414.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 417.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 420.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 423.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 426.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 429.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 432.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 435.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 438.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 441.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 444.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 447.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 450.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 453.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 456.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 459.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 462.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 465.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 468.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 471.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 474.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 477.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 480.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 483.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 486.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 489.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 492.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 495.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 498.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 501.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Subsection: Time vs. Volume
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 504.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 507.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 510.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 513.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 516.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 519.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 522.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 525.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 528.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 531.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 534.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 537.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 540.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 543.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 546.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 549.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 552.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 555.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 558.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 561.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 564.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 567.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 570.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 573.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 576.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 579.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 582.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 585.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 588.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 591.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 594.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 597.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 600.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 603.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 606.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 609.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 612.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 615.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 618.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 621.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 624.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 627.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Subsection: Time vs. Volume
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 630.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 633.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 636.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 639.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 642.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 645.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 648.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 651.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 654.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 657.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 660.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 663.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 666.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 669.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 672.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 675.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 678.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 681.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 684.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 687.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 690.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 693.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 696.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 699.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 702.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 705.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 708.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 711.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 714.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 717.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 720.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 723.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 726.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 729.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 732.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 735.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 738.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 741.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 744.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 747.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 750.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 753.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Subsection: Time vs. Volume
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 756.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 759.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 762.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 765.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 768.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 771.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 774.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 777.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 780.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 783.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 786.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 789.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 792.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 795.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 798.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 801.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 804.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 807.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 810.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 813.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 816.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 819.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 822.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 825.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 828.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 831.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 834.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 837.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 840.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 843.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 846.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 849.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 852.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 855.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 858.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 861.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 864.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 867.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 870.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 873.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 876.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 879.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Subsection: Time vs. Volume
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 882.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 885.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 888.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 891.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 894.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 897.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 900.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 903.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 906.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 909.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 912.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 915.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 918.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 921.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 924.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 927.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 930.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 933.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 936.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 939.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 942.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 945.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 948.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 951.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 954.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 957.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 960.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 963.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 966.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 969.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 972.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 975.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 978.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 981.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 984.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 987.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 990.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 993.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 996.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 999.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,002.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,005.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Subsection: Time vs. Volume
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 1,008.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,011.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,014.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,017.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,020.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,023.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,026.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,029.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,032.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,035.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,038.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,041.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,044.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,047.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,050.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,053.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,056.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,059.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,062.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,065.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,068.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,071.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,074.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,077.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,080.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,083.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,086.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,089.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,092.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,095.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,098.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,101.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,104.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,107.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,110.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,113.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,116.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,119.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,122.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,125.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,128.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,131.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Subsection: Time vs. Volume
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 1,134.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,137.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,140.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,143.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,146.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,149.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,152.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,155.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,158.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,161.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,164.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,167.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,170.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,173.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,176.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,179.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,182.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,185.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,188.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,191.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,194.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,197.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,200.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,203.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,206.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,209.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,212.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,215.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,218.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,221.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,224.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,227.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,230.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,233.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,236.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,239.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,242.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,245.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,248.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,251.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,254.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,257.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Subsection: Time vs. Volume
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 1,260.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,263.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,266.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,269.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,272.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,275.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,278.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,281.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,284.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,287.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,290.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,293.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,296.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,299.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,302.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,305.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,308.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,311.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,314.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,317.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,320.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,323.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,326.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,329.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,332.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,335.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,338.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,341.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,344.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,347.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,350.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,353.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,356.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,359.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,362.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,365.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,368.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,371.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,374.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,377.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,380.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,383.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Subsection: Time vs. Volume
Label: BASIN
Scenario: 100 year

Return Event: 100 years
Storm Event: Rumson - 1 - 100 Year

Time vs. Volume (ft³)

Output Time increment = 0.600 min
Time on left represents time for first value in each row.

| Time (min) | Volume (ft ³) |
|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 1,386.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,389.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,392.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,395.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,398.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,401.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,404.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,407.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,410.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,413.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,416.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,419.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,422.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,425.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,428.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,431.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,434.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,437.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1,440.000 | 0.000 | (N/A) | (N/A) | (N/A) | (N/A) |

Subsection: Elevation vs. Volume Curve
Label: BASIN
Scenario: 100 year

Return Event: 100 years
Storm Event: Rumson - 1 - 100 Year

Elevation-Volume

| Pond Elevation (ft) | Pond Volume (ft ³) |
|------------------------|-----------------------------------|
| 11.10 | 0.000 |
| 11.30 | 0.000 |
| 11.55 | 854.750 |
| 11.80 | 1,709.500 |
| 12.05 | 2,564.250 |
| 12.30 | 3,419.000 |
| 12.55 | 4,273.740 |
| 12.80 | 5,128.490 |
| 13.05 | 5,983.240 |
| 13.30 | 6,837.990 |
| 13.55 | 7,692.740 |
| 13.80 | 8,547.490 |

Subsection: Outlet Input Data

Return Event: 100 years

Label: Composite Outlet Structure - 1

Storm Event: Rumson - 1 - 100 Year

Scenario: 100 year

Requested Pond Water Surface Elevations

| | |
|-----------------------|----------|
| Minimum (Headwater) | 11.10 ft |
| Increment (Headwater) | 0.10 ft |
| Maximum (Headwater) | 13.80 ft |

Outlet Connectivity

| Structure Type | Outlet ID | Direction | Outfall | E1 (ft) | E2 (ft) |
|--------------------|-------------|-----------|----------|------------|------------|
| Orifice-Circular | Orifice - 1 | Forward | TW | 11.33 | 13.83 |
| Rectangular Weir | Weir - 2 | Forward | Weir - 1 | 12.60 | 13.83 |
| Rectangular Weir | Weir - 1 | Forward | TW | 12.00 | 13.83 |
| Tailwater Settings | Tailwater | | | (N/A) | (N/A) |

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Scenario: 100 year

Return Event: 100 years

Storm Event: Rumson - 1 - 100 Year

Structure ID: Orifice - 1
Structure Type: Orifice-Circular

| | |
|---------------------|----------|
| Number of Openings | 1 |
| Elevation | 11.10 ft |
| Orifice Diameter | 5.5 in |
| Orifice Coefficient | 0.600 |

Structure ID: Weir - 1
Structure Type: Rectangular Weir

| | |
|--------------------|-----------------|
| Number of Openings | 1 |
| Elevation | 12.85 ft |
| Weir Length | 0.50 ft |
| Weir Coefficient | 3.20 (ft^0.5)/s |

Structure ID: TW
Structure Type: TW Setup, DS Channel

| | |
|--------------------------|-----------------------|
| Tailwater Type | Downstream Channel |
| Catalog Conduit | 12 inch |
| Channel Slope | 0.009 ft/ft |
| Channel Invert Elevation | 8.63 ft |

Convergence Tolerances

| | |
|----------------------------------|--------------|
| Maximum Iterations | 30 |
| Tailwater Tolerance (Minimum) | 0.01 ft |
| Tailwater Tolerance (Maximum) | 0.50 ft |
| Headwater Tolerance (Minimum) | 0.01 ft |
| Headwater Tolerance (Maximum) | 0.50 ft |
| Flow Tolerance (Minimum) | 0.001 ft³/s |
| Flow Tolerance (Maximum) | 10.000 ft³/s |

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 1
Scenario: 100 year

Return Event: 100 years
Storm Event: Rumson - 1 - 100 Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = ()

Upstream ID =
Downstream ID =

| Water Surface Elevation (ft) | Flow (ft ³ /s) | Tailwater Elevation (ft) | Convergence Error (ft) |
|------------------------------|---------------------------|--------------------------|------------------------|
| Contributing Structures | | | |

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 1
Scenario: 100 year

Return Event: 100 years
Storm Event: Rumson - 1 - 100 Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = ()

Upstream ID =

Downstream ID =

| Water Surface Elevation (ft) | Flow (ft ³ /s) | Tailwater Elevation (ft) | Convergence Error (ft) |
|------------------------------|---------------------------|--------------------------|------------------------|
| Contributing Structures | | | |

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: BASIN
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Infiltration

| | |
|-----------------------------------|-----------------|
| Infiltration Method (Computed) | No Infiltration |
|-----------------------------------|-----------------|

Initial Conditions

| | |
|---------------------------------------|-------------------------|
| Elevation (Water Surface, Initial) | 11.10 ft |
| Volume (Initial) | 0.000 ft ³ |
| Flow (Initial Outlet) | 0.00 ft ³ /s |
| Flow (Initial Infiltration) | 0.00 ft ³ /s |
| Flow (Initial, Total) | 0.00 ft ³ /s |
| Time Increment | 0.600 min |

| Elevation (ft) | Outflow (ft ³ /s) | Storage (ft ³) | Area (acres) | Infiltration (ft ³ /s) | Flow (Total) (ft ³ /s) | 2S/t + O (ft ³ /s) |
|-------------------|---------------------------------|-------------------------------|-----------------|--------------------------------------|--------------------------------------|----------------------------------|
| 11.10 | 0.00 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 |
| 11.20 | 0.02 | 0.000 | 0.000 | 0.00 | 0.02 | 0.02 |
| 11.30 | 0.08 | 0.000 | 0.000 | 0.00 | 0.08 | 0.08 |
| 11.40 | 0.18 | 341.900 | 0.000 | 0.00 | 0.18 | 19.17 |
| 11.50 | 0.29 | 683.800 | 0.000 | 0.00 | 0.29 | 38.28 |
| 11.60 | 0.41 | 1,025.700 | 0.000 | 0.00 | 0.41 | 57.40 |
| 11.70 | 0.48 | 1,367.600 | 0.000 | 0.00 | 0.48 | 76.46 |
| 11.80 | 0.54 | 1,709.500 | 0.000 | 0.00 | 0.54 | 95.52 |
| 11.90 | 0.60 | 2,051.400 | 0.000 | 0.00 | 0.60 | 114.57 |
| 12.00 | 0.65 | 2,393.300 | 0.000 | 0.00 | 0.65 | 133.61 |
| 12.10 | 0.70 | 2,735.200 | 0.000 | 0.00 | 0.70 | 152.65 |
| 12.20 | 0.74 | 3,077.100 | 0.000 | 0.00 | 0.74 | 171.69 |
| 12.30 | 0.78 | 3,419.000 | 0.000 | 0.00 | 0.78 | 190.73 |
| 12.40 | 0.82 | 3,760.896 | 0.000 | 0.00 | 0.82 | 209.76 |
| 12.50 | 0.86 | 4,102.792 | 0.000 | 0.00 | 0.86 | 228.79 |
| 12.60 | 0.90 | 4,444.690 | 0.000 | 0.00 | 0.90 | 247.82 |
| 12.70 | 0.93 | 4,786.590 | 0.000 | 0.00 | 0.93 | 266.85 |
| 12.80 | 0.96 | 5,128.490 | 0.000 | 0.00 | 0.96 | 285.88 |
| 12.85 | 0.98 | 5,299.440 | 0.000 | 0.00 | 0.98 | 295.39 |
| 12.90 | 1.01 | 5,470.390 | 0.000 | 0.00 | 1.01 | 304.92 |
| 13.00 | 1.12 | 5,812.290 | 0.000 | 0.00 | 1.12 | 324.02 |
| 13.10 | 1.26 | 6,154.190 | 0.000 | 0.00 | 1.26 | 343.16 |
| 13.20 | 1.42 | 6,496.090 | 0.000 | 0.00 | 1.42 | 362.31 |
| 13.30 | 1.60 | 6,837.990 | 0.000 | 0.00 | 1.60 | 381.49 |
| 13.40 | 1.80 | 7,179.890 | 0.000 | 0.00 | 1.80 | 400.68 |
| 13.50 | 2.01 | 7,521.790 | 0.000 | 0.00 | 2.01 | 419.89 |
| 13.60 | 2.24 | 7,863.690 | 0.000 | 0.00 | 2.24 | 439.11 |
| 13.70 | 2.48 | 8,205.590 | 0.000 | 0.00 | 2.48 | 458.34 |
| 13.80 | 2.73 | 8,547.490 | 0.000 | 0.00 | 2.73 | 477.59 |

Subsection: Pond Inflow Summary
Label: BASIN (IN)
Scenario: 2 year

Return Event: 2 years
Storm Event: Rumson - 1 - 2 Year

Summary for Hydrograph Addition at 'BASIN'

| Upstream Link | Upstream Node |
|-----------------------------|---------------|
| <Catchment to Outflow Node> | DA-1 |

Node Inflows

| Inflow Type | Element | Volume (ft ³) | Time to Peak (min) | Flow (Peak) (ft ³ /s) |
|-------------|---------|------------------------------|-----------------------|-------------------------------------|
| Flow (From) | DA-1 | 5,566.308 | 5.400 | 2.26 |
| Flow (In) | BASIN | 5,566.308 | 5.400 | 2.26 |

Subsection: Pond Inflow Summary
Label: BASIN (IN)
Scenario: 10 year

Return Event: 10 years
Storm Event: Rumson - 1 - 10 Year

Summary for Hydrograph Addition at 'BASIN'

| Upstream Link | Upstream Node |
|-----------------------------|---------------|
| <Catchment to Outflow Node> | DA-1 |

Node Inflows

| Inflow Type | Element | Volume (ft ³) | Time to Peak (min) | Flow (Peak) (ft ³ /s) |
|-------------|---------|------------------------------|-----------------------|-------------------------------------|
| Flow (From) | DA-1 | 7,998.923 | 5.400 | 3.60 |
| Flow (In) | BASIN | 7,998.923 | 5.400 | 3.60 |

Subsection: Pond Inflow Summary
Label: BASIN (IN)
Scenario: 100 year

Return Event: 100 years
Storm Event: Rumson - 1 - 100 Year

Summary for Hydrograph Addition at 'BASIN'

| Upstream Link | Upstream Node |
|-----------------------------|---------------|
| <Catchment to Outflow Node> | DA-1 |

Node Inflows

| Inflow Type | Element | Volume (ft ³) | Time to Peak (min) | Flow (Peak) (ft ³ /s) |
|-------------|---------|------------------------------|-----------------------|-------------------------------------|
| Flow (From) | DA-1 | 11,551.568 | 5.400 | 4.94 |
| Flow (In) | BASIN | 11,551.568 | 5.400 | 4.94 |

Subsection: C and Area (Post-Development)
Label: DA-1
Scenario: 2 year

Return Event: 2 years
Storm Event: Rumson - 1 - 2 Year

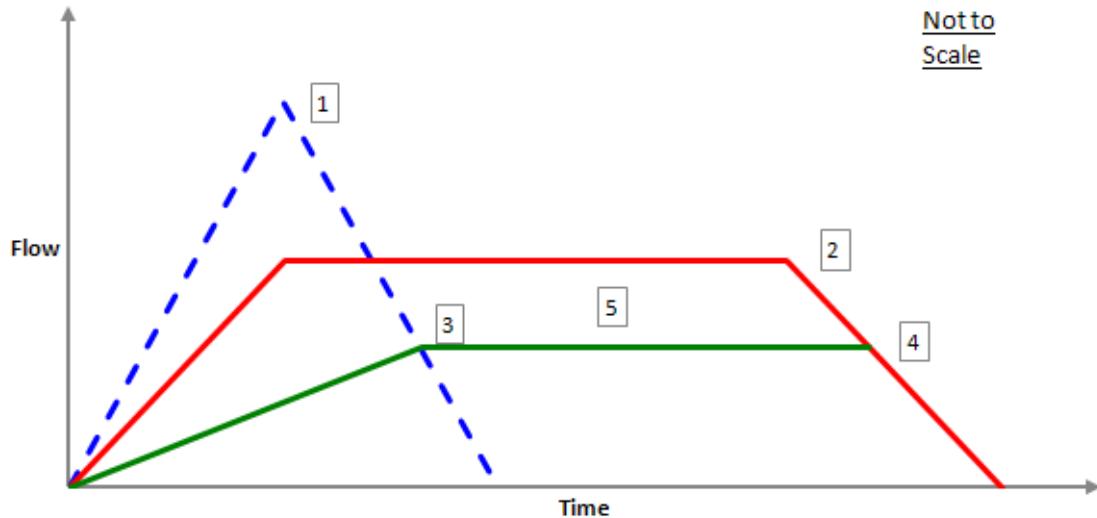
C and Area Results

| Soil/Surface Description | C Coefficient | Area (acres) | Area (Adjusted) (acres) |
|------------------------------|---------------|-----------------|----------------------------|
| Impervious | 0.990 | 1.140 | (N/A) |
| Lawn, Type C | 0.510 | 0.150 | (N/A) |
| Lawn, Type D | 0.650 | 0.060 | (N/A) |
| Weighted C & Total Area ---> | 0.922 | 1.350 | 1.244 |

Subsection: Modified Rational Graph
 Label: DA-1
 Scenario: 2 year

Return Event: 2 years
 Storm Event: Rumson - 1 - 2 Year

| | |
|--|------------|
| Method Type | Method T |
| Time of Duration (Modified Rational, Critical) | 41.000 min |



| [1] | [2] |
|--|---|
| Time of Concentration (Modified Rational, Composite) | 5.000 min |
| Intensity (Modified Rational, Peak) | 4.540 in/h |
| Flow (Modified Rational, Peak) | 5.70 ft³/s |
| | Time of Duration (Modified Rational, Critical) 41.000 min |
| | Intensity (Modified Rational, Critical) 1.804 in/h |
| | Flow (Modified Rational, Critical) 2.26 ft³/s |

| [3] | |
|--|------------|
| First Outflow Breakpoint (Modified Rational, Method T) | 43.967 min |
| Flow (Modified Rational, Allowable) | 0.92 ft³/s |

| [4] | [5] |
|---|--|
| Second Outflow Breakpoint (Modified Rational) | 9.192 min |
| Flow (Modified Rational, Allowable) | 0.92 ft³/s |
| | Storage (Modified Rational, Estimated) 3,338.002 ft³ |

Subsection: Modified Rational Storm Calculations
 Label: DA-1
 Scenario: 2 year

Return Event: 2 years
 Storm Event: Rumson - 1 - 2 Year

Modified Rational Method
--- Summary for Single Storm Frequency ---

$$Q = CiA * \text{Units Conversion}; \text{ Where Conversion} = 43560 / (12 * 3600)$$

| C Coefficient (Weighted) | C Coefficient (Adjusted) | Duration (min) | Intensity (in/h) | Area (acres) | Flow (Peak) (ft³/s) | Volume (Inflow) (ft³) | Volume (Storage) (ft³) |
|--------------------------|--------------------------|----------------|------------------|--------------|---------------------|-----------------------|------------------------|
| 0.922 | 0.922 | 5.000 | 4.540 | 1.350 | 5.70 | 1,708.667 | 1,432.667 |
| 0.922 | 0.922 | 10.000 | 3.620 | 1.350 | 4.54 | 2,724.835 | 2,178.500 |
| 0.922 | 0.922 | 15.000 | 3.030 | 1.350 | 3.80 | 3,421.098 | 2,604.207 |
| 0.922 | 0.922 | 20.000 | 2.717 | 1.350 | 3.41 | 4,089.761 | 3,000.722 |
| 0.922 | 0.922 | 30.000 | 2.090 | 1.350 | 2.62 | 4,719.534 | 3,089.665 |
| 0.922 | 0.922 | 40.000 | 1.830 | 1.350 | 2.30 | 5,509.887 | 3,334.897 |
| Storage Maximum | | | | | | | |
| 0.922 | 0.922 | 41.000 | 1.804 | 1.350 | 2.26 | 5,567.395 | 3,338.002 |
| 0.922 | 0.922 | 50.000 | 1.570 | 1.350 | 1.97 | 5,908.827 | 3,190.995 |
| 0.922 | 0.922 | 60.000 | 1.310 | 1.350 | 1.64 | 5,916.354 | 2,659.316 |
| 0.922 | 0.922 | 120.000 | 0.813 | 1.350 | 1.02 | 7,343.505 | 821.693 |
| 0.922 | 0.922 | 180.000 | 0.598 | 1.350 | 0.75 | (N/A) | (N/A) |

Subsection: Modified Rational Hydrograph
 Label: DA-1
 Scenario: 2 year

Return Event: 2 years
 Storm Event: Rumson - 1 - 2 Year

Modified Rational Method

$$Q = CiA * \text{Unit Conversion}; \text{ Where Conversion} = 43560 / (12 * 3600)$$

| Frequency (years) | C Coefficient | C Adjustment Factor | C Coefficient (Final) | Intensity (in/h) | Area (acres) | Flow (Peak) (ft³/s) |
|----------------------|-------------------|------------------------|--------------------------|---------------------|-----------------|------------------------|
| 2 | 1.000 | 1.000 | 0.922 | 1.804 | 1.350 | 2.26 |
| <hr/> | | | | | | |
| | Peak Discharge | | | 2.26 ft³/s | | |
| | Time to Peak | | | 27.000 min | | |
| | Hydrograph Volume | | | 7,999.124 ft³ | | |

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.600 min

Time on left represents time for first value in each row.

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0.600 | 0.27 | 0.54 | 0.81 | 1.09 | 1.36 |
| 3.600 | 1.63 | 1.90 | 2.17 | 2.26 | 2.26 |
| 6.600 | 2.26 | 2.26 | 2.26 | 2.26 | 2.26 |
| 9.600 | 2.26 | 2.26 | 2.26 | 2.26 | 2.26 |
| 12.600 | 2.26 | 2.26 | 2.26 | 2.26 | 2.26 |
| 15.600 | 2.26 | 2.26 | 2.26 | 2.26 | 2.26 |
| 18.600 | 2.26 | 2.26 | 2.26 | 2.26 | 2.26 |
| 21.600 | 2.26 | 2.26 | 2.26 | 2.26 | 2.26 |
| 24.600 | 2.26 | 2.26 | 2.26 | 2.26 | 2.26 |
| 27.600 | 2.26 | 2.26 | 2.26 | 2.26 | 2.26 |
| 30.600 | 2.26 | 2.26 | 2.26 | 2.26 | 2.26 |
| 33.600 | 2.26 | 2.26 | 2.26 | 2.26 | 2.26 |
| 36.600 | 2.26 | 2.26 | 2.26 | 2.26 | 2.26 |
| 39.600 | 2.26 | 2.26 | 2.26 | 2.08 | 1.81 |
| 42.600 | 1.54 | 1.27 | 1.00 | 0.72 | 0.45 |
| 45.600 | 0.18 | 0.00 | (N/A) | (N/A) | (N/A) |

Subsection: C and Area (Post-Development)
Label: DA-1
Scenario: 10 year

Return Event: 10 years
Storm Event: Rumson - 1 - 10 Year

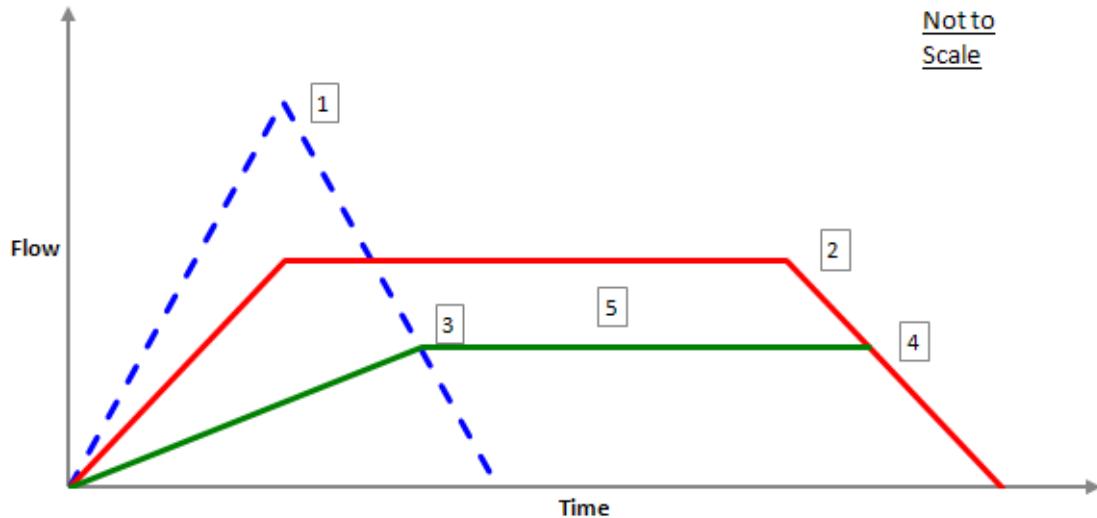
C and Area Results

| Soil/Surface Description | C Coefficient | Area (acres) | Area (Adjusted) (acres) |
|------------------------------|---------------|-----------------|----------------------------|
| Impervious | 0.990 | 1.140 | (N/A) |
| Lawn, Type C | 0.510 | 0.150 | (N/A) |
| Lawn, Type D | 0.650 | 0.060 | (N/A) |
| Weighted C & Total Area ---> | 0.922 | 1.350 | 1.244 |

Subsection: Modified Rational Graph
 Label: DA-1
 Scenario: 10 year

Return Event: 10 years
 Storm Event: Rumson - 1 - 10 Year

| | |
|--|------------|
| Method Type | Method T |
| Time of Duration (Modified Rational, Critical) | 37.000 min |



| [1] | [2] |
|--|---|
| Time of Concentration (Modified Rational, Composite) | 5.000 min |
| Intensity (Modified Rational, Peak) | 6.430 in/h |
| Flow (Modified Rational, Peak) | 8.07 ft³/s |
| | Time of Duration (Modified Rational, Critical) 37.000 min |
| | Intensity (Modified Rational, Critical) 2.873 in/h |
| | Flow (Modified Rational, Critical) 3.60 ft³/s |

| [3] | |
|--|------------|
| First Outflow Breakpoint (Modified Rational, Method T) | 39.267 min |
| Flow (Modified Rational, Allowable) | 1.97 ft³/s |

| [4] | [5] |
|---|--|
| Second Outflow Breakpoint (Modified Rational) | 8.779 min |
| Flow (Modified Rational, Allowable) | 1.97 ft³/s |
| | Storage (Modified Rational, Estimated) 3,718.312 ft³ |

Subsection: Modified Rational Storm Calculations
 Label: DA-1
 Scenario: 10 year

Return Event: 10 years
 Storm Event: Rumson - 1 - 10 Year

Modified Rational Method
--- Summary for Single Storm Frequency ---

$$Q = CiA * \text{Units Conversion}; \text{ Where Conversion} = 43560 / (12 * 3600)$$

| C Coefficient (Weighted) | C Coefficient (Adjusted) | Duration (min) | Intensity (in/h) | Area (acres) | Flow (Peak) (ft³/s) | Volume (Inflow) (ft³) | Volume (Storage) (ft³) |
|--------------------------|--------------------------|----------------|------------------|--------------|---------------------|-----------------------|------------------------|
| 0.922 | 0.922 | 5.000 | 6.430 | 1.350 | 8.07 | 2,419.985 | 1,828.985 |
| 0.922 | 0.922 | 10.000 | 5.140 | 1.350 | 6.45 | 3,868.964 | 2,705.076 |
| 0.922 | 0.922 | 15.000 | 4.330 | 1.350 | 5.43 | 4,888.896 | 3,150.895 |
| 0.922 | 0.922 | 20.000 | 3.930 | 1.350 | 4.93 | 5,916.354 | 3,598.261 |
| 0.922 | 0.922 | 30.000 | 3.130 | 1.350 | 3.93 | 7,068.011 | 3,598.096 |
| Storage Maximum | | | | | | | |
| 0.922 | 0.922 | 37.000 | 2.873 | 1.350 | 3.60 | 8,002.383 | 3,718.312 |
| 0.922 | 0.922 | 40.000 | 2.763 | 1.350 | 3.47 | 8,320.030 | 3,687.787 |
| 0.922 | 0.922 | 50.000 | 2.397 | 1.350 | 3.01 | 9,020.056 | 3,231.504 |
| 0.922 | 0.922 | 60.000 | 2.030 | 1.350 | 2.55 | 9,168.091 | 2,232.509 |
| 0.922 | 0.922 | 120.000 | 1.280 | 1.350 | 1.61 | (N/A) | (N/A) |

Subsection: Modified Rational Hydrograph
 Label: DA-1
 Scenario: 10 year

Return Event: 10 years
 Storm Event: Rumson - 1 - 10 Year

Modified Rational Method

$$Q = CiA * \text{Unit Conversion}; \text{ Where Conversion} = 43560 / (12 * 3600)$$

| Frequency (years) | C Coefficient | C Adjustment Factor | C Coefficient (Final) | Intensity (in/h) | Area (acres) | Flow (Peak) (ft³/s) |
|----------------------|-------------------|------------------------|--------------------------|---------------------|-----------------|------------------------|
| 10 | 1.000 | 1.000 | 0.922 | 2.873 | 1.350 | 3.60 |
| <hr/> | | | | | | |
| | Peak Discharge | | | 3.60 ft³/s | | |
| | Time to Peak | | | 24.600 min | | |
| | Hydrograph Volume | | | 7,991.137 ft³ | | |

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.600 min

Time on left represents time for first value in each row.

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0.600 | 0.43 | 0.87 | 1.30 | 1.73 | 2.16 |
| 3.600 | 2.60 | 3.03 | 3.46 | 3.60 | 3.60 |
| 6.600 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 |
| 9.600 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 |
| 12.600 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 |
| 15.600 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 |
| 18.600 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 |
| 21.600 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 |
| 24.600 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 |
| 27.600 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 |
| 30.600 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 |
| 33.600 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 |
| 36.600 | 3.60 | 3.46 | 3.03 | 2.60 | 2.16 |
| 39.600 | 1.73 | 1.30 | 0.87 | 0.43 | 0.00 |

Subsection: C and Area (Post-Development)
Label: DA-1
Scenario: 100 year

Return Event: 100 years
Storm Event: Rumson - 1 - 100 Year

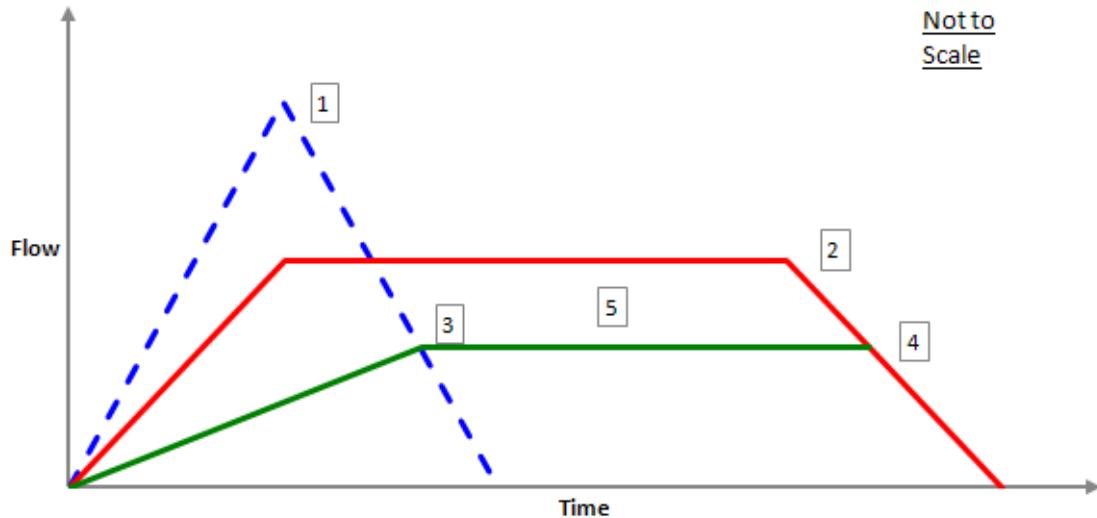
C and Area Results

| Soil/Surface Description | C Coefficient | Area (acres) | Area (Adjusted) (acres) |
|------------------------------|---------------|-----------------|----------------------------|
| Impervious | 0.990 | 1.140 | (N/A) |
| Lawn, Type C | 0.510 | 0.150 | (N/A) |
| Lawn, Type D | 0.650 | 0.060 | (N/A) |
| Weighted C & Total Area ---> | 0.922 | 1.350 | 1.244 |

Subsection: Modified Rational Graph
 Label: DA-1
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

| | |
|--|------------|
| Method Type | Method T |
| Time of Duration (Modified Rational, Critical) | 39.000 min |



| [1] | [2] |
|--|--|
| Time of Concentration (Modified Rational, Composite) | 5.000 min |
| Intensity (Modified Rational, Peak) | 8.530 in/h |
| Flow (Modified Rational, Peak) | 10.70 ft³/s |
| | Time of Duration (Modified Rational, Critical) |
| | 39.000 min |
| | Intensity (Modified Rational, Critical) |
| | 3.935 in/h |
| | Flow (Modified Rational, Critical) |
| | 4.94 ft³/s |

| [3] | |
|--|------------|
| First Outflow Breakpoint (Modified Rational, Method T) | 41.215 min |
| Flow (Modified Rational, Allowable) | 2.75 ft³/s |

| [4] | [5] |
|---|--|
| Second Outflow Breakpoint (Modified Rational) | 8.715 min |
| Flow (Modified Rational, Allowable) | 2.75 ft³/s |
| | Storage (Modified Rational, Estimated) |
| | 5,240.353 ft³ |

Subsection: Modified Rational Storm Calculations
 Label: DA-1
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Modified Rational Method
--- Summary for Single Storm Frequency ---

$$Q = CiA * \text{Units Conversion}; \text{ Where Conversion} = 43560 / (12 * 3600)$$

| C Coefficient (Weighted) | C Coefficient (Adjusted) | Duration (min) | Intensity (in/h) | Area (acres) | Flow (Peak) (ft³/s) | Volume (Inflow) (ft³) | Volume (Storage) (ft³) |
|-----------------------------|-----------------------------|-------------------|---------------------|-----------------|------------------------|-----------------------------|------------------------------|
| 0.922 | 0.922 | 5.000 | 8.530 | 1.350 | 10.70 | 3,210.337 | 2,385.337 |
| 0.922 | 0.922 | 10.000 | 6.760 | 1.350 | 8.48 | 5,088.366 | 3,466.121 |
| 0.922 | 0.922 | 15.000 | 5.690 | 1.350 | 7.14 | 6,424.438 | 4,002.347 |
| 0.922 | 0.922 | 20.000 | 5.240 | 1.350 | 6.57 | 7,888.472 | 4,655.029 |
| 0.922 | 0.922 | 30.000 | 4.340 | 1.350 | 5.44 | 9,800.373 | 4,952.714 |
| Storage Maximum | | | | | | | |
| 0.922 | 0.922 | 39.000 | 3.935 | 1.350 | 4.94 | 11,551.568 | 5,240.353 |
| 0.922 | 0.922 | 40.000 | 3.890 | 1.350 | 4.88 | 11,712.273 | 5,238.717 |
| 0.922 | 0.922 | 50.000 | 3.440 | 1.350 | 4.32 | 12,946.729 | 4,853.580 |
| 0.922 | 0.922 | 60.000 | 2.990 | 1.350 | 3.75 | 13,503.739 | 3,800.150 |
| 0.922 | 0.922 | 120.000 | 1.950 | 1.350 | 2.45 | (N/A) | (N/A) |

Subsection: Modified Rational Hydrograph
 Label: DA-1
 Scenario: 100 year

Return Event: 100 years
 Storm Event: Rumson - 1 - 100 Year

Modified Rational Method

$$Q = CiA * \text{Unit Conversion}; \text{ Where Conversion} = 43560 / (12 * 3600)$$

| Frequency (years) | C Coefficient | C Adjustment Factor | C Coefficient (Final) | Intensity (in/h) | Area (acres) | Flow (Peak) (ft³/s) |
|----------------------|---------------|------------------------|--------------------------|---------------------|-----------------|------------------------|
| 100 | 1.000 | 1.000 | 0.922 | 3.935 | 1.350 | 4.94 |
| <hr/> | | | | | | |
| Peak Discharge | | | | | | 4.94 ft³/s |
| Time to Peak | | | | | | 25.800 min |
| Hydrograph Volume | | | | | | 14,206.652 ft³ |

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.600 min

Time on left represents time for first value in each row.

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0.600 | 0.59 | 1.18 | 1.78 | 2.37 | 2.96 |
| 3.600 | 3.55 | 4.15 | 4.74 | 4.94 | 4.94 |
| 6.600 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| 9.600 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| 12.600 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| 15.600 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| 18.600 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| 21.600 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| 24.600 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| 27.600 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| 30.600 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| 33.600 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| 36.600 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| 39.600 | 4.34 | 3.75 | 3.16 | 2.57 | 1.97 |
| 42.600 | 1.38 | 0.79 | 0.20 | 0.00 | (N/A) |

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TELEPHONE : (732) 312-9800
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WALL, NEW JERSEY 07719

| | | |
|-----------------|--|-----------------|
| PROJECT NUMBER: | 15053.003 | |
| PROJECT NAME: | Multi-Family Major Site plan for Rumson Road | |
| CALCULATED BY: | SP | DATE: 1/20/2021 |
| CHECKED BY: | DATE: | |
| REVISED BY: | DATE: | |

Sheet: 1 of 1

TIME OF CONCENTRATION CALCULATOR

| | | | |
|---------------------|----------------------------|-------------------------|----------|
| DRAINAGE AREA NAME: | Drainage Area 1 - Proposed | DRAINAGE AREA NOTATION: | DA1 - Pr |
|---------------------|----------------------------|-------------------------|----------|

Sheet Flow:

Segment 1

| | | |
|---|--|---------|
| Surface Type: | Smooth surface (concrete, asphalt, gravel, or bare soil) | |
| Slope of land surface, S: | 0.024 | ft/ft |
| n-value (from Table 15-1): | 0.011 | --- |
| Limiting Length of flow, l: | 66.0 | ft |
| 2-year, 24 hours rainfall, P ₂ : | 3.410 | in |
| Travel time, T _t : | 0.8 | minutes |

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(nl)^{0.8}}{(P_2)^{0.5} S^{0.4}} \quad (\text{Eq 15-8})$$

Sheet Flow:

Segment 2

| | | |
|---|--|---------|
| Surface Type: | Smooth surface (concrete, asphalt, gravel, or bare soil) | |
| Slope of land surface, S: | 0.007 | ft/ft |
| n-value (from Table 15-1): | 0.011 | --- |
| Limiting Length of flow, l: | 34.0 | ft |
| 2-year, 24 hours rainfall, P ₂ : | 3.410 | in |
| Travel time, T _t : | 0.8 | minutes |

Shallow Concentrated Flow:

Segment 3

| | | |
|-------------------------------|-----------------------------------|---------|
| Surface Type: | Pavement and small upland gullies | |
| Flow length, l: | 16.5 | ft |
| Slope of land surface, S: | 0.007 | ft/ft |
| n-value (from Table 15-3): | 0.025 | --- |
| Average velocity, V: | 1.701 | ft/s |
| Travel time, T _t : | 0.2 | minutes |

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{l}{3,600V} \quad (\text{Eq 15-1})$$

Open Channel Flow:

Segment 4

Segment 5

| | | | | |
|-------------------------------|-------|-----------------|-------|-----------------|
| Hydraulic Length: | 75 | ft | 11 | ft |
| Slope: | 0.005 | ft/ft | 0.005 | ft/ft |
| Manning's n: | 0.013 | --- | 0.013 | --- |
| Flow Area: | 1.23 | ft ² | 1.23 | ft ² |
| Wetted Perimeter: | 3.93 | ft | 3.93 | ft |
| Velocity: | 3.72 | fps | 3.72 | fps |
| Travel time, T _t : | 0.3 | minutes | 0.0 | minutes |

Total Time of Concentration:

2

minutes

user input

MIN 5 MIN PROVIDED BY NOAA.
TC OF 5 MINUTES USED

UNDERGROUND BASIN DRAIN DOWN CALCULATIONS

| Time (min) | BASIN - 100 year - Flow (Total In) (ft ³ /s) | BASIN - 100 year - Flow (Total Out) (ft ³ /s) | BASIN - 100 year - Volume (ft ³) | BASIN - 100 year - Elevation (ft) |
|---------------|--|---|--|---|
| 0.000 | 0.00 | 0.00 | 0.000 | 11.10 |
| 0.600 | 0.59 | 0.09 | 9.000 | 11.30 |
| 1.200 | 1.18 | 0.09 | 38.000 | 11.31 |
| 1.800 | 1.78 | 0.11 | 87.000 | 11.33 |
| 2.400 | 2.37 | 0.13 | 158.000 | 11.35 |
| 3.000 | 2.96 | 0.15 | 249.000 | 11.37 |
| 3.600 | 3.55 | 0.18 | 360.000 | 11.41 |
| 4.200 | 4.15 | 0.23 | 491.000 | 11.44 |
| 4.800 | 4.74 | 0.28 | 642.000 | 11.49 |
| 5.400 | 4.94 | 0.34 | 805.000 | 11.54 |
| 6.000 | 4.94 | 0.39 | 970.000 | 11.58 |
| 6.600 | 4.94 | 0.44 | 1,132.000 | 11.63 |
| 7.200 | 4.94 | 0.47 | 1,294.000 | 11.68 |
| 7.800 | 4.94 | 0.50 | 1,454.000 | 11.73 |
| 8.400 | 4.94 | 0.53 | 1,613.000 | 11.77 |
| 9.000 | 4.94 | 0.55 | 1,772.000 | 11.82 |
| 9.600 | 4.94 | 0.58 | 1,929.000 | 11.86 |
| 10.200 | 4.94 | 0.60 | 2,085.000 | 11.91 |
| 10.800 | 4.94 | 0.63 | 2,241.000 | 11.96 |
| 11.400 | 4.94 | 0.65 | 2,396.000 | 12.00 |
| 12.000 | 4.94 | 0.67 | 2,549.000 | 12.05 |
| 12.600 | 4.94 | 0.69 | 2,703.000 | 12.09 |
| 13.200 | 4.94 | 0.71 | 2,855.000 | 12.14 |
| 13.800 | 4.94 | 0.73 | 3,007.000 | 12.18 |
| 14.400 | 4.94 | 0.75 | 3,158.000 | 12.22 |
| 15.000 | 4.94 | 0.77 | 3,308.000 | 12.27 |
| 15.600 | 4.94 | 0.79 | 3,458.000 | 12.31 |
| 16.200 | 4.94 | 0.80 | 3,607.000 | 12.35 |
| 16.800 | 4.94 | 0.82 | 3,755.000 | 12.40 |
| 17.400 | 4.94 | 0.84 | 3,903.000 | 12.44 |
| 18.000 | 4.94 | 0.85 | 4,051.000 | 12.48 |
| 18.600 | 4.94 | 0.87 | 4,197.000 | 12.53 |
| 19.200 | 4.94 | 0.88 | 4,343.000 | 12.57 |
| 19.800 | 4.94 | 0.90 | 4,489.000 | 12.61 |
| 20.400 | 4.94 | 0.91 | 4,634.000 | 12.66 |
| 21.000 | 4.94 | 0.93 | 4,779.000 | 12.70 |
| 21.600 | 4.94 | 0.94 | 4,923.000 | 12.74 |
| 22.200 | 4.94 | 0.96 | 5,066.000 | 12.78 |
| 22.800 | 4.94 | 0.97 | 5,209.000 | 12.82 |
| 23.400 | 4.94 | 0.99 | 5,352.000 | 12.87 |
| 24.000 | 4.94 | 1.02 | 5,493.000 | 12.91 |
| 24.600 | 4.94 | 1.06 | 5,633.000 | 12.95 |
| 25.200 | 4.94 | 1.11 | 5,772.000 | 12.99 |
| 25.800 | 4.94 | 1.16 | 5,909.000 | 13.03 |
| 26.400 | 4.94 | 1.21 | 6,044.000 | 13.07 |
| 27.000 | 4.94 | 1.27 | 6,177.000 | 13.11 |
| 27.600 | 4.94 | 1.33 | 6,308.000 | 13.14 |

Graph Data Table - New Graph

| Time (min) | BASIN - 100 year - Flow (Total In) (ft ³ /s) | BASIN - 100 year - Flow (Total Out) (ft ³ /s) | BASIN - 100 year - Volume (ft ³) | BASIN - 100 year - Elevation (ft) |
|---------------|--|---|--|---|
| 28.200 | 4.94 | 1.39 | 6,437,000 | 13.18 |
| 28.800 | 4.94 | 1.45 | 6,563,000 | 13.22 |
| 29.400 | 4.94 | 1.52 | 6,688,000 | 13.26 |
| 30.000 | 4.94 | 1.58 | 6,809,000 | 13.29 |
| 30.600 | 4.94 | 1.65 | 6,929,000 | 13.33 |
| 31.200 | 4.94 | 1.72 | 7,046,000 | 13.36 |
| 31.800 | 4.94 | 1.78 | 7,161,000 | 13.39 |
| 32.400 | 4.94 | 1.85 | 7,273,000 | 13.43 |
| 33.000 | 4.94 | 1.92 | 7,383,000 | 13.46 |
| 33.600 | 4.94 | 1.99 | 7,490,000 | 13.49 |
| 34.200 | 4.94 | 2.06 | 7,595,000 | 13.52 |
| 34.800 | 4.94 | 2.13 | 7,697,000 | 13.55 |
| 35.400 | 4.94 | 2.19 | 7,797,000 | 13.58 |
| 36.000 | 4.94 | 2.26 | 7,895,000 | 13.61 |
| 36.600 | 4.94 | 2.32 | 7,990,000 | 13.64 |
| 37.200 | 4.94 | 2.39 | 8,083,000 | 13.66 |
| 37.800 | 4.94 | 2.45 | 8,174,000 | 13.69 |
| 38.400 | 4.94 | 2.52 | 8,262,000 | 13.72 |
| 39.000 | 4.94 | 2.58 | 8,348,000 | 13.74 |
| 39.600 | 4.34 | 2.64 | 8,421,000 | 13.76 |
| 40.200 | 3.75 | 2.67 | 8,471,000 | 13.78 |
| 40.800 | 3.16 | 2.69 | 8,499,000 | 13.79 |
| 41.400 | 2.57 | 2.70 | 8,505,000 | 13.79 |
| 42.000 | 1.97 | 2.69 | 8,490,000 | 13.78 |
| 42.600 | 1.38 | 2.66 | 8,454,000 | 13.77 |
| 43.200 | 0.79 | 2.62 | 8,398,000 | 13.76 |
| 43.800 | 0.20 | 2.56 | 8,322,000 | 13.73 |
| 44.400 | 0.00 | 2.50 | 8,235,000 | 13.71 |
| 45.000 | 0.00 | 2.43 | 8,146,000 | 13.68 |
| 45.600 | 0.00 | 2.37 | 8,060,000 | 13.66 |
| 46.200 | 0.00 | 2.31 | 7,975,000 | 13.63 |
| 46.800 | 0.00 | 2.26 | 7,893,000 | 13.61 |
| 47.400 | 0.00 | 2.20 | 7,813,000 | 13.59 |
| 48.000 | 0.00 | 2.15 | 7,734,000 | 13.56 |
| 48.600 | 0.00 | 2.10 | 7,658,000 | 13.54 |
| 49.200 | 0.00 | 2.05 | 7,583,000 | 13.52 |
| 49.800 | 0.00 | 2.00 | 7,510,000 | 13.50 |
| 50.400 | 0.00 | 1.96 | 7,439,000 | 13.48 |
| 51.000 | 0.00 | 1.91 | 7,369,000 | 13.46 |
| 51.600 | 0.00 | 1.87 | 7,301,000 | 13.44 |
| 52.200 | 0.00 | 1.83 | 7,235,000 | 13.42 |
| 52.800 | 0.00 | 1.79 | 7,169,000 | 13.40 |
| 53.400 | 0.00 | 1.75 | 7,106,000 | 13.38 |
| 54.000 | 0.00 | 1.72 | 7,043,000 | 13.36 |
| 54.600 | 0.00 | 1.68 | 6,982,000 | 13.34 |
| 55.200 | 0.00 | 1.65 | 6,922,000 | 13.32 |
| 55.800 | 0.00 | 1.61 | 6,864,000 | 13.31 |

Graph Data Table - New Graph

| Time (min) | BASIN - 100 year - Flow (Total In) (ft ³ /s) | BASIN - 100 year - Flow (Total Out) (ft ³ /s) | BASIN - 100 year - Volume (ft ³) | BASIN - 100 year - Elevation (ft) |
|---------------|--|---|--|---|
| 56.400 | 0.00 | 1.58 | 6,806,000 | 13.29 |
| 57.000 | 0.00 | 1.55 | 6,750,000 | 13.27 |
| 57.600 | 0.00 | 1.52 | 6,694,000 | 13.26 |
| 58.200 | 0.00 | 1.49 | 6,640,000 | 13.24 |
| 58.800 | 0.00 | 1.47 | 6,587,000 | 13.23 |
| 59.400 | 0.00 | 1.44 | 6,535,000 | 13.21 |
| 60.000 | 0.00 | 1.41 | 6,483,000 | 13.20 |
| 60.600 | 0.00 | 1.39 | 6,433,000 | 13.18 |
| 61.200 | 0.00 | 1.36 | 6,383,000 | 13.17 |
| 61.800 | 0.00 | 1.34 | 6,335,000 | 13.15 |
| 62.400 | 0.00 | 1.32 | 6,287,000 | 13.14 |
| 63.000 | 0.00 | 1.30 | 6,240,000 | 13.13 |
| 63.600 | 0.00 | 1.28 | 6,193,000 | 13.11 |
| 64.200 | 0.00 | 1.25 | 6,148,000 | 13.10 |
| 64.800 | 0.00 | 1.24 | 6,103,000 | 13.09 |
| 65.400 | 0.00 | 1.22 | 6,059,000 | 13.07 |
| 66.000 | 0.00 | 1.20 | 6,015,000 | 13.06 |
| 66.600 | 0.00 | 1.18 | 5,972,000 | 13.05 |
| 67.200 | 0.00 | 1.17 | 5,930,000 | 13.03 |
| 67.800 | 0.00 | 1.15 | 5,888,000 | 13.02 |
| 68.400 | 0.00 | 1.13 | 5,847,000 | 13.01 |
| 69.000 | 0.00 | 1.12 | 5,807,000 | 13.00 |
| 69.600 | 0.00 | 1.11 | 5,767,000 | 12.99 |
| 70.200 | 0.00 | 1.09 | 5,727,000 | 12.98 |
| 70.800 | 0.00 | 1.08 | 5,688,000 | 12.96 |
| 71.400 | 0.00 | 1.07 | 5,649,000 | 12.95 |
| 72.000 | 0.00 | 1.06 | 5,611,000 | 12.94 |
| 72.600 | 0.00 | 1.05 | 5,573,000 | 12.93 |
| 73.200 | 0.00 | 1.03 | 5,536,000 | 12.92 |
| 73.800 | 0.00 | 1.02 | 5,499,000 | 12.91 |
| 74.400 | 0.00 | 1.01 | 5,462,000 | 12.90 |
| 75.000 | 0.00 | 1.00 | 5,426,000 | 12.89 |
| 75.600 | 0.00 | 1.00 | 5,390,000 | 12.88 |
| 76.200 | 0.00 | 0.99 | 5,354,000 | 12.87 |
| 76.800 | 0.00 | 0.98 | 5,319,000 | 12.86 |
| 77.400 | 0.00 | 0.98 | 5,283,000 | 12.85 |
| 78.000 | 0.00 | 0.97 | 5,248,000 | 12.84 |
| 78.600 | 0.00 | 0.97 | 5,213,000 | 12.82 |
| 79.200 | 0.00 | 0.97 | 5,178,000 | 12.81 |
| 79.800 | 0.00 | 0.96 | 5,143,000 | 12.80 |
| 80.400 | 0.00 | 0.96 | 5,109,000 | 12.79 |
| 81.000 | 0.00 | 0.96 | 5,074,000 | 12.78 |
| 81.600 | 0.00 | 0.95 | 5,040,000 | 12.77 |
| 82.200 | 0.00 | 0.95 | 5,006,000 | 12.76 |
| 82.800 | 0.00 | 0.95 | 4,971,000 | 12.75 |
| 83.400 | 0.00 | 0.94 | 4,937,000 | 12.74 |
| 84.000 | 0.00 | 0.94 | 4,903,000 | 12.73 |

Graph Data Table - New Graph

| Time (min) | BASIN - 100 year - Flow (Total In) (ft ³ /s) | BASIN - 100 year - Flow (Total Out) (ft ³ /s) | BASIN - 100 year - Volume (ft ³) | BASIN - 100 year - Elevation (ft) |
|---------------|--|---|--|---|
| 84.600 | 0.00 | 0.94 | 4,870,000 | 12.72 |
| 85.200 | 0.00 | 0.93 | 4,836,000 | 12.71 |
| 85.800 | 0.00 | 0.93 | 4,802,000 | 12.70 |
| 86.400 | 0.00 | 0.93 | 4,769,000 | 12.69 |
| 87.000 | 0.00 | 0.92 | 4,735,000 | 12.69 |
| 87.600 | 0.00 | 0.92 | 4,702,000 | 12.68 |
| 88.200 | 0.00 | 0.92 | 4,669,000 | 12.67 |
| 88.800 | 0.00 | 0.91 | 4,636,000 | 12.66 |
| 89.400 | 0.00 | 0.91 | 4,603,000 | 12.65 |
| 90.000 | 0.00 | 0.91 | 4,571,000 | 12.64 |
| 90.600 | 0.00 | 0.90 | 4,538,000 | 12.63 |
| 91.200 | 0.00 | 0.90 | 4,505,000 | 12.62 |
| 91.800 | 0.00 | 0.90 | 4,473,000 | 12.61 |
| 92.400 | 0.00 | 0.89 | 4,441,000 | 12.60 |
| 93.000 | 0.00 | 0.89 | 4,409,000 | 12.59 |
| 93.600 | 0.00 | 0.89 | 4,377,000 | 12.58 |
| 94.200 | 0.00 | 0.88 | 4,345,000 | 12.57 |
| 94.800 | 0.00 | 0.88 | 4,313,000 | 12.56 |
| 95.400 | 0.00 | 0.88 | 4,281,000 | 12.55 |
| 96.000 | 0.00 | 0.87 | 4,250,000 | 12.54 |
| 96.600 | 0.00 | 0.87 | 4,218,000 | 12.53 |
| 97.200 | 0.00 | 0.87 | 4,187,000 | 12.52 |
| 97.800 | 0.00 | 0.86 | 4,156,000 | 12.52 |
| 98.400 | 0.00 | 0.86 | 4,125,000 | 12.51 |
| 99.000 | 0.00 | 0.86 | 4,094,000 | 12.50 |
| 99.600 | 0.00 | 0.85 | 4,063,000 | 12.49 |
| 100.200 | 0.00 | 0.85 | 4,032,000 | 12.48 |
| 100.800 | 0.00 | 0.85 | 4,002,000 | 12.47 |
| 101.400 | 0.00 | 0.84 | 3,971,000 | 12.46 |
| 102.000 | 0.00 | 0.84 | 3,941,000 | 12.45 |
| 102.600 | 0.00 | 0.84 | 3,910,000 | 12.44 |
| 103.200 | 0.00 | 0.83 | 3,880,000 | 12.43 |
| 103.800 | 0.00 | 0.83 | 3,850,000 | 12.43 |
| 104.400 | 0.00 | 0.83 | 3,821,000 | 12.42 |
| 105.000 | 0.00 | 0.83 | 3,791,000 | 12.41 |
| 105.600 | 0.00 | 0.82 | 3,761,000 | 12.40 |
| 106.200 | 0.00 | 0.82 | 3,732,000 | 12.39 |
| 106.800 | 0.00 | 0.81 | 3,702,000 | 12.38 |
| 107.400 | 0.00 | 0.81 | 3,673,000 | 12.37 |
| 108.000 | 0.00 | 0.81 | 3,644,000 | 12.37 |
| 108.600 | 0.00 | 0.80 | 3,615,000 | 12.36 |
| 109.200 | 0.00 | 0.80 | 3,586,000 | 12.35 |
| 109.800 | 0.00 | 0.80 | 3,557,000 | 12.34 |
| 110.400 | 0.00 | 0.79 | 3,528,000 | 12.33 |
| 111.000 | 0.00 | 0.79 | 3,500,000 | 12.32 |
| 111.600 | 0.00 | 0.79 | 3,471,000 | 12.32 |
| 112.200 | 0.00 | 0.79 | 3,443,000 | 12.31 |

Graph Data Table - New Graph

| Time (min) | BASIN - 100 year - Flow (Total In) (ft ³ /s) | BASIN - 100 year - Flow (Total Out) (ft ³ /s) | BASIN - 100 year - Volume (ft ³) | BASIN - 100 year - Elevation (ft) |
|---------------|--|---|--|---|
| 112.800 | 0.00 | 0.78 | 3,415,000 | 12.30 |
| 113.400 | 0.00 | 0.78 | 3,387,000 | 12.29 |
| 114.000 | 0.00 | 0.78 | 3,359,000 | 12.28 |
| 114.600 | 0.00 | 0.77 | 3,331,000 | 12.27 |
| 115.200 | 0.00 | 0.77 | 3,303,000 | 12.27 |
| 115.800 | 0.00 | 0.77 | 3,276,000 | 12.26 |
| 116.400 | 0.00 | 0.76 | 3,248,000 | 12.25 |
| 117.000 | 0.00 | 0.76 | 3,221,000 | 12.24 |
| 117.600 | 0.00 | 0.76 | 3,193,000 | 12.23 |
| 118.200 | 0.00 | 0.75 | 3,166,000 | 12.23 |
| 118.800 | 0.00 | 0.75 | 3,139,000 | 12.22 |
| 119.400 | 0.00 | 0.75 | 3,112,000 | 12.21 |
| 120.000 | 0.00 | 0.74 | 3,086,000 | 12.20 |
| 120.600 | 0.00 | 0.74 | 3,059,000 | 12.19 |
| 121.200 | 0.00 | 0.74 | 3,032,000 | 12.19 |
| 121.800 | 0.00 | 0.73 | 3,006,000 | 12.18 |
| 122.400 | 0.00 | 0.73 | 2,980,000 | 12.17 |
| 123.000 | 0.00 | 0.73 | 2,954,000 | 12.16 |
| 123.600 | 0.00 | 0.72 | 2,928,000 | 12.16 |
| 124.200 | 0.00 | 0.72 | 2,902,000 | 12.15 |
| 124.800 | 0.00 | 0.72 | 2,876,000 | 12.14 |
| 125.400 | 0.00 | 0.71 | 2,850,000 | 12.13 |
| 126.000 | 0.00 | 0.71 | 2,825,000 | 12.13 |
| 126.600 | 0.00 | 0.71 | 2,799,000 | 12.12 |
| 127.200 | 0.00 | 0.70 | 2,774,000 | 12.11 |
| 127.800 | 0.00 | 0.70 | 2,749,000 | 12.10 |
| 128.400 | 0.00 | 0.70 | 2,723,000 | 12.10 |
| 129.000 | 0.00 | 0.69 | 2,698,000 | 12.09 |
| 129.600 | 0.00 | 0.69 | 2,674,000 | 12.08 |
| 130.200 | 0.00 | 0.69 | 2,649,000 | 12.07 |
| 130.800 | 0.00 | 0.68 | 2,624,000 | 12.07 |
| 131.400 | 0.00 | 0.68 | 2,600,000 | 12.06 |
| 132.000 | 0.00 | 0.68 | 2,575,000 | 12.05 |
| 132.600 | 0.00 | 0.67 | 2,551,000 | 12.05 |
| 133.200 | 0.00 | 0.67 | 2,527,000 | 12.04 |
| 133.800 | 0.00 | 0.67 | 2,503,000 | 12.03 |
| 134.400 | 0.00 | 0.66 | 2,479,000 | 12.03 |
| 135.000 | 0.00 | 0.66 | 2,455,000 | 12.02 |
| 135.600 | 0.00 | 0.66 | 2,432,000 | 12.01 |
| 136.200 | 0.00 | 0.65 | 2,408,000 | 12.00 |
| 136.800 | 0.00 | 0.65 | 2,385,000 | 12.00 |
| 137.400 | 0.00 | 0.65 | 2,361,000 | 11.99 |
| 138.000 | 0.00 | 0.64 | 2,338,000 | 11.98 |
| 138.600 | 0.00 | 0.64 | 2,315,000 | 11.98 |
| 139.200 | 0.00 | 0.64 | 2,292,000 | 11.97 |
| 139.800 | 0.00 | 0.63 | 2,269,000 | 11.96 |
| 140.400 | 0.00 | 0.63 | 2,247,000 | 11.96 |

Graph Data Table - New Graph

| Time (min) | BASIN - 100 year - Flow (Total In) (ft ³ /s) | BASIN - 100 year - Flow (Total Out) (ft ³ /s) | BASIN - 100 year - Volume (ft ³) | BASIN - 100 year - Elevation (ft) |
|---------------|--|---|--|---|
| 141.000 | 0.00 | 0.63 | 2,224.000 | 11.95 |
| 141.600 | 0.00 | 0.62 | 2,202.000 | 11.94 |
| 142.200 | 0.00 | 0.62 | 2,179.000 | 11.94 |
| 142.800 | 0.00 | 0.62 | 2,157.000 | 11.93 |
| 143.400 | 0.00 | 0.61 | 2,135.000 | 11.92 |
| 144.000 | 0.00 | 0.61 | 2,113.000 | 11.92 |
| 144.600 | 0.00 | 0.61 | 2,091.000 | 11.91 |
| 145.200 | 0.00 | 0.60 | 2,069.000 | 11.91 |
| 145.800 | 0.00 | 0.60 | 2,048.000 | 11.90 |
| 146.400 | 0.00 | 0.60 | 2,026.000 | 11.89 |
| 147.000 | 0.00 | 0.59 | 2,005.000 | 11.89 |
| 147.600 | 0.00 | 0.59 | 1,984.000 | 11.88 |
| 148.200 | 0.00 | 0.59 | 1,962.000 | 11.87 |
| 148.800 | 0.00 | 0.58 | 1,941.000 | 11.87 |
| 149.400 | 0.00 | 0.58 | 1,921.000 | 11.86 |
| 150.000 | 0.00 | 0.58 | 1,900.000 | 11.86 |
| 150.600 | 0.00 | 0.57 | 1,879.000 | 11.85 |
| 151.200 | 0.00 | 0.57 | 1,859.000 | 11.84 |
| 151.800 | 0.00 | 0.57 | 1,838.000 | 11.84 |
| 152.400 | 0.00 | 0.56 | 1,818.000 | 11.83 |
| 153.000 | 0.00 | 0.56 | 1,798.000 | 11.83 |
| 153.600 | 0.00 | 0.56 | 1,778.000 | 11.82 |
| 154.200 | 0.00 | 0.55 | 1,758.000 | 11.81 |
| 154.800 | 0.00 | 0.55 | 1,738.000 | 11.81 |
| 155.400 | 0.00 | 0.55 | 1,718.000 | 11.80 |
| 156.000 | 0.00 | 0.54 | 1,698.000 | 11.80 |
| 156.600 | 0.00 | 0.54 | 1,679.000 | 11.79 |
| 157.200 | 0.00 | 0.54 | 1,660.000 | 11.79 |
| 157.800 | 0.00 | 0.53 | 1,640.000 | 11.78 |
| 158.400 | 0.00 | 0.53 | 1,621.000 | 11.77 |
| 159.000 | 0.00 | 0.53 | 1,602.000 | 11.77 |
| 159.600 | 0.00 | 0.52 | 1,583.000 | 11.76 |
| 160.200 | 0.00 | 0.52 | 1,565.000 | 11.76 |
| 160.800 | 0.00 | 0.52 | 1,546.000 | 11.75 |
| 161.400 | 0.00 | 0.51 | 1,528.000 | 11.75 |
| 162.000 | 0.00 | 0.51 | 1,509.000 | 11.74 |
| 162.600 | 0.00 | 0.51 | 1,491.000 | 11.74 |
| 163.200 | 0.00 | 0.50 | 1,473.000 | 11.73 |
| 163.800 | 0.00 | 0.50 | 1,455.000 | 11.73 |
| 164.400 | 0.00 | 0.50 | 1,437.000 | 11.72 |
| 165.000 | 0.00 | 0.49 | 1,419.000 | 11.72 |
| 165.600 | 0.00 | 0.49 | 1,401.000 | 11.71 |
| 166.200 | 0.00 | 0.49 | 1,384.000 | 11.70 |
| 166.800 | 0.00 | 0.48 | 1,366.000 | 11.70 |
| 167.400 | 0.00 | 0.48 | 1,349.000 | 11.69 |
| 168.000 | 0.00 | 0.48 | 1,332.000 | 11.69 |
| 168.600 | 0.00 | 0.47 | 1,315.000 | 11.68 |

Graph Data Table - New Graph

| Time (min) | BASIN - 100 year - Flow (Total In) (ft ³ /s) | BASIN - 100 year - Flow (Total Out) (ft ³ /s) | BASIN - 100 year - Volume (ft ³) | BASIN - 100 year - Elevation (ft) |
|---------------|--|---|--|---|
| 169.200 | 0.00 | 0.47 | 1,298.000 | 11.68 |
| 169.800 | 0.00 | 0.47 | 1,281.000 | 11.67 |
| 170.400 | 0.00 | 0.46 | 1,264.000 | 11.67 |
| 171.000 | 0.00 | 0.46 | 1,248.000 | 11.66 |
| 171.600 | 0.00 | 0.46 | 1,231.000 | 11.66 |
| 172.200 | 0.00 | 0.45 | 1,215.000 | 11.66 |
| 172.800 | 0.00 | 0.45 | 1,199.000 | 11.65 |
| 173.400 | 0.00 | 0.45 | 1,183.000 | 11.65 |
| 174.000 | 0.00 | 0.44 | 1,167.000 | 11.64 |
| 174.600 | 0.00 | 0.44 | 1,151.000 | 11.64 |
| 175.200 | 0.00 | 0.44 | 1,135.000 | 11.63 |
| 175.800 | 0.00 | 0.43 | 1,119.000 | 11.63 |
| 176.400 | 0.00 | 0.43 | 1,104.000 | 11.62 |
| 177.000 | 0.00 | 0.43 | 1,088.000 | 11.62 |
| 177.600 | 0.00 | 0.42 | 1,073.000 | 11.61 |
| 178.200 | 0.00 | 0.42 | 1,058.000 | 11.61 |
| 178.800 | 0.00 | 0.42 | 1,043.000 | 11.61 |
| 179.400 | 0.00 | 0.41 | 1,028.000 | 11.60 |
| 180.000 | 0.00 | 0.41 | 1,013.000 | 11.60 |
| 180.600 | 0.00 | 0.40 | 999.000 | 11.59 |
| 181.200 | 0.00 | 0.40 | 984.000 | 11.59 |
| 181.800 | 0.00 | 0.39 | 970.000 | 11.58 |
| 182.400 | 0.00 | 0.39 | 956.000 | 11.58 |
| 183.000 | 0.00 | 0.38 | 942.000 | 11.58 |
| 183.600 | 0.00 | 0.38 | 928.000 | 11.57 |
| 184.200 | 0.00 | 0.37 | 914.000 | 11.57 |
| 184.800 | 0.00 | 0.37 | 901.000 | 11.56 |
| 185.400 | 0.00 | 0.37 | 888.000 | 11.56 |
| 186.000 | 0.00 | 0.36 | 875.000 | 11.56 |
| 186.600 | 0.00 | 0.36 | 862.000 | 11.55 |
| 187.200 | 0.00 | 0.35 | 849.000 | 11.55 |
| 187.800 | 0.00 | 0.35 | 837.000 | 11.54 |
| 188.400 | 0.00 | 0.34 | 824.000 | 11.54 |
| 189.000 | 0.00 | 0.34 | 812.000 | 11.54 |
| 189.600 | 0.00 | 0.33 | 800.000 | 11.53 |
| 190.200 | 0.00 | 0.33 | 788.000 | 11.53 |
| 190.800 | 0.00 | 0.33 | 776.000 | 11.53 |
| 191.400 | 0.00 | 0.32 | 764.000 | 11.52 |
| 192.000 | 0.00 | 0.32 | 753.000 | 11.52 |
| 192.600 | 0.00 | 0.31 | 741.000 | 11.52 |
| 193.200 | 0.00 | 0.31 | 730.000 | 11.51 |
| 193.800 | 0.00 | 0.31 | 719.000 | 11.51 |
| 194.400 | 0.00 | 0.30 | 708.000 | 11.51 |
| 195.000 | 0.00 | 0.30 | 697.000 | 11.50 |
| 195.600 | 0.00 | 0.29 | 687.000 | 11.50 |
| 196.200 | 0.00 | 0.29 | 676.000 | 11.50 |
| 196.800 | 0.00 | 0.29 | 666.000 | 11.49 |

Graph Data Table - New Graph

| Time (min) | BASIN - 100 year - Flow (Total In) (ft ³ /s) | BASIN - 100 year - Flow (Total Out) (ft ³ /s) | BASIN - 100 year - Volume (ft ³) | BASIN - 100 year - Elevation (ft) |
|---------------|--|---|--|---|
| 197.400 | 0.00 | 0.28 | 655.000 | 11.49 |
| 198.000 | 0.00 | 0.28 | 645.000 | 11.49 |
| 198.600 | 0.00 | 0.28 | 635.000 | 11.49 |
| 199.200 | 0.00 | 0.27 | 625.000 | 11.48 |
| 199.800 | 0.00 | 0.27 | 615.000 | 11.48 |
| 200.400 | 0.00 | 0.27 | 606.000 | 11.48 |
| 201.000 | 0.00 | 0.26 | 596.000 | 11.47 |
| 201.600 | 0.00 | 0.26 | 587.000 | 11.47 |
| 202.200 | 0.00 | 0.26 | 577.000 | 11.47 |
| 202.800 | 0.00 | 0.25 | 568.000 | 11.47 |
| 203.400 | 0.00 | 0.25 | 559.000 | 11.46 |
| 204.000 | 0.00 | 0.25 | 550.000 | 11.46 |
| 204.600 | 0.00 | 0.25 | 541.000 | 11.46 |
| 205.200 | 0.00 | 0.24 | 532.000 | 11.46 |
| 205.800 | 0.00 | 0.24 | 524.000 | 11.45 |
| 206.400 | 0.00 | 0.24 | 515.000 | 11.45 |
| 207.000 | 0.00 | 0.23 | 507.000 | 11.45 |
| 207.600 | 0.00 | 0.23 | 498.000 | 11.45 |
| 208.200 | 0.00 | 0.23 | 490.000 | 11.44 |
| 208.800 | 0.00 | 0.23 | 482.000 | 11.44 |
| 209.400 | 0.00 | 0.22 | 474.000 | 11.44 |
| 210.000 | 0.00 | 0.22 | 466.000 | 11.44 |
| 210.600 | 0.00 | 0.22 | 458.000 | 11.43 |
| 211.200 | 0.00 | 0.21 | 450.000 | 11.43 |
| 211.800 | 0.00 | 0.21 | 442.000 | 11.43 |
| 212.400 | 0.00 | 0.21 | 435.000 | 11.43 |
| 213.000 | 0.00 | 0.21 | 427.000 | 11.42 |
| 213.600 | 0.00 | 0.20 | 420.000 | 11.42 |
| 214.200 | 0.00 | 0.20 | 412.000 | 11.42 |
| 214.800 | 0.00 | 0.20 | 405.000 | 11.42 |
| 215.400 | 0.00 | 0.20 | 398.000 | 11.42 |
| 216.000 | 0.00 | 0.19 | 391.000 | 11.41 |
| 216.600 | 0.00 | 0.19 | 384.000 | 11.41 |
| 217.200 | 0.00 | 0.19 | 377.000 | 11.41 |
| 217.800 | 0.00 | 0.19 | 370.000 | 11.41 |
| 218.400 | 0.00 | 0.19 | 364.000 | 11.41 |
| 219.000 | 0.00 | 0.18 | 357.000 | 11.40 |
| 219.600 | 0.00 | 0.18 | 350.000 | 11.40 |
| 220.200 | 0.00 | 0.18 | 344.000 | 11.40 |
| 220.800 | 0.00 | 0.18 | 338.000 | 11.40 |
| 221.400 | 0.00 | 0.18 | 331.000 | 11.40 |
| 222.000 | 0.00 | 0.17 | 325.000 | 11.40 |
| 222.600 | 0.00 | 0.17 | 319.000 | 11.39 |
| 223.200 | 0.00 | 0.17 | 313.000 | 11.39 |
| 223.800 | 0.00 | 0.17 | 306.000 | 11.39 |
| 224.400 | 0.00 | 0.17 | 300.000 | 11.39 |
| 225.000 | 0.00 | 0.17 | 294.000 | 11.39 |

Graph Data Table - New Graph

| Time (min) | BASIN - 100 year - Flow (Total In) (ft ³ /s) | BASIN - 100 year - Flow (Total Out) (ft ³ /s) | BASIN - 100 year - Volume (ft ³) | BASIN - 100 year - Elevation (ft) |
|---------------|--|---|--|---|
| 225.600 | 0.00 | 0.16 | 289.000 | 11.38 |
| 226.200 | 0.00 | 0.16 | 283.000 | 11.38 |
| 226.800 | 0.00 | 0.16 | 277.000 | 11.38 |
| 227.400 | 0.00 | 0.16 | 271.000 | 11.38 |
| 228.000 | 0.00 | 0.16 | 265.000 | 11.38 |
| 228.600 | 0.00 | 0.16 | 260.000 | 11.38 |
| 229.200 | 0.00 | 0.15 | 254.000 | 11.37 |
| 229.800 | 0.00 | 0.15 | 249.000 | 11.37 |
| 230.400 | 0.00 | 0.15 | 243.000 | 11.37 |
| 231.000 | 0.00 | 0.15 | 238.000 | 11.37 |
| 231.600 | 0.00 | 0.15 | 232.000 | 11.37 |
| 232.200 | 0.00 | 0.15 | 227.000 | 11.37 |
| 232.800 | 0.00 | 0.15 | 222.000 | 11.36 |
| 233.400 | 0.00 | 0.14 | 217.000 | 11.36 |
| 234.000 | 0.00 | 0.14 | 212.000 | 11.36 |
| 234.600 | 0.00 | 0.14 | 206.000 | 11.36 |
| 235.200 | 0.00 | 0.14 | 201.000 | 11.36 |
| 235.800 | 0.00 | 0.14 | 196.000 | 11.36 |
| 236.400 | 0.00 | 0.14 | 191.000 | 11.36 |
| 237.000 | 0.00 | 0.14 | 187.000 | 11.35 |
| 237.600 | 0.00 | 0.13 | 182.000 | 11.35 |
| 238.200 | 0.00 | 0.13 | 177.000 | 11.35 |
| 238.800 | 0.00 | 0.13 | 172.000 | 11.35 |
| 239.400 | 0.00 | 0.13 | 167.000 | 11.35 |
| 240.000 | 0.00 | 0.13 | 163.000 | 11.35 |
| 240.600 | 0.00 | 0.13 | 158.000 | 11.35 |
| 241.200 | 0.00 | 0.13 | 153.000 | 11.34 |
| 241.800 | 0.00 | 0.13 | 149.000 | 11.34 |
| 242.400 | 0.00 | 0.12 | 144.000 | 11.34 |
| 243.000 | 0.00 | 0.12 | 140.000 | 11.34 |
| 243.600 | 0.00 | 0.12 | 136.000 | 11.34 |
| 244.200 | 0.00 | 0.12 | 131.000 | 11.34 |
| 244.800 | 0.00 | 0.12 | 127.000 | 11.34 |
| 245.400 | 0.00 | 0.12 | 123.000 | 11.34 |
| 246.000 | 0.00 | 0.12 | 118.000 | 11.33 |
| 246.600 | 0.00 | 0.12 | 114.000 | 11.33 |
| 247.200 | 0.00 | 0.11 | 110.000 | 11.33 |
| 247.800 | 0.00 | 0.11 | 106.000 | 11.33 |
| 248.400 | 0.00 | 0.11 | 102.000 | 11.33 |
| 249.000 | 0.00 | 0.11 | 98.000 | 11.33 |
| 249.600 | 0.00 | 0.11 | 94.000 | 11.33 |
| 250.200 | 0.00 | 0.11 | 90.000 | 11.33 |
| 250.800 | 0.00 | 0.11 | 86.000 | 11.33 |
| 251.400 | 0.00 | 0.11 | 82.000 | 11.32 |
| 252.000 | 0.00 | 0.11 | 78.000 | 11.32 |
| 252.600 | 0.00 | 0.11 | 74.000 | 11.32 |
| 253.200 | 0.00 | 0.10 | 71.000 | 11.32 |

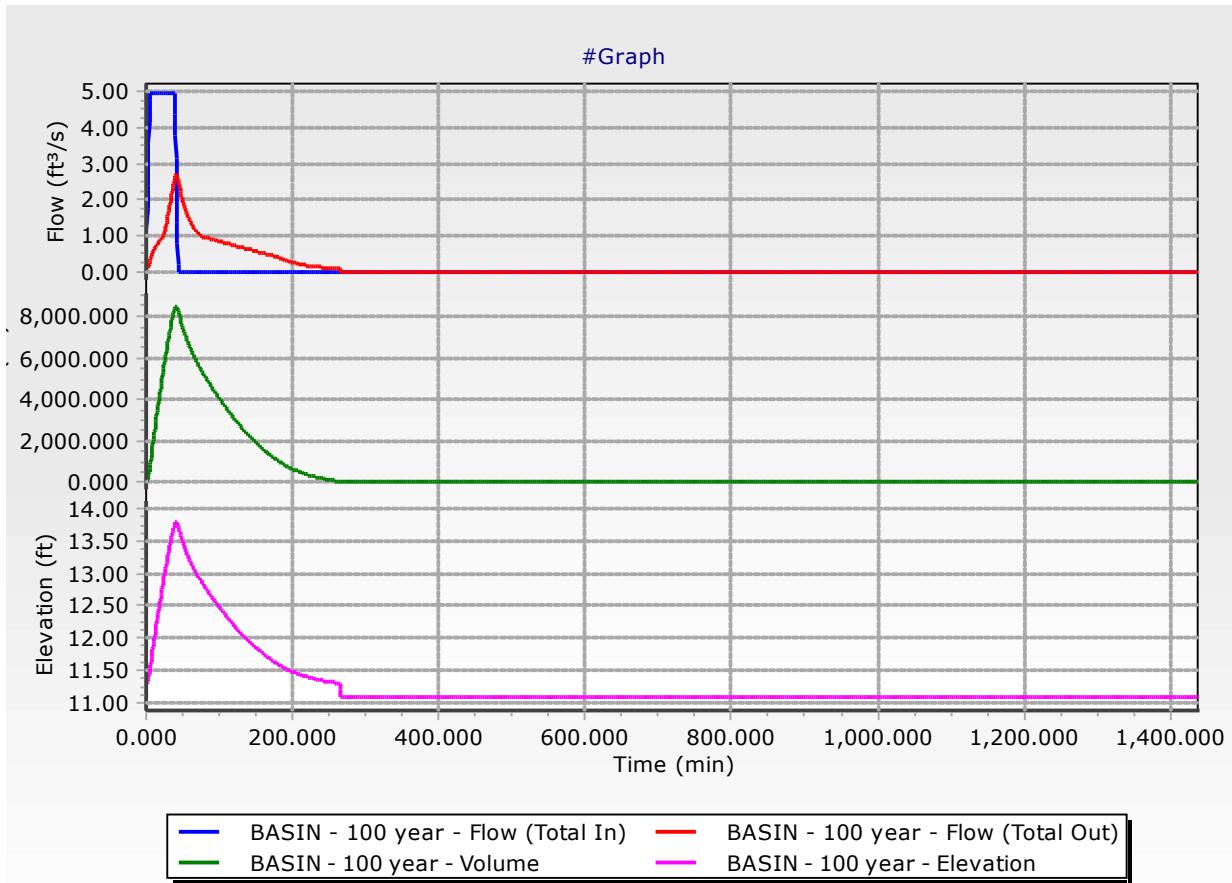
Graph Data Table - New Graph

| Time (min) | BASIN - 100 year - Flow (Total In) (ft ³ /s) | BASIN - 100 year - Flow (Total Out) (ft ³ /s) | BASIN - 100 year - Volume (ft ³) | BASIN - 100 year - Elevation (ft) |
|---------------|--|---|--|---|
| 253.800 | 0.00 | 0.10 | 67.000 | 11.32 |
| 254.400 | 0.00 | 0.10 | 63.000 | 11.32 |
| 255.000 | 0.00 | 0.10 | 60.000 | 11.32 |
| 255.600 | 0.00 | 0.10 | 56.000 | 11.32 |
| 256.200 | 0.00 | 0.10 | 52.000 | 11.32 |
| 256.800 | 0.00 | 0.10 | 49.000 | 11.31 |
| 257.400 | 0.00 | 0.10 | 45.000 | 11.31 |
| 258.000 | 0.00 | 0.10 | 42.000 | 11.31 |
| 258.600 | 0.00 | 0.10 | 38.000 | 11.31 |
| 259.200 | 0.00 | 0.09 | 35.000 | 11.31 |
| 259.800 | 0.00 | 0.09 | 32.000 | 11.31 |
| 260.400 | 0.00 | 0.09 | 28.000 | 11.31 |
| 261.000 | 0.00 | 0.09 | 25.000 | 11.31 |
| 261.600 | 0.00 | 0.09 | 22.000 | 11.31 |
| 262.200 | 0.00 | 0.09 | 19.000 | 11.31 |
| 262.800 | 0.00 | 0.09 | 15.000 | 11.30 |
| 263.400 | 0.00 | 0.09 | 12.000 | 11.30 |
| 264.000 | 0.00 | 0.09 | 9.000 | 11.30 |
| 264.600 | 0.00 | 0.09 | 6.000 | 11.30 |
| 265.200 | 0.00 | 0.09 | 3.000 | 11.30 |
| 265.800 | 0.00 | 0.03 | 0.000 | 11.22 |
| 266.400 | 0.00 | 0.00 | 0.000 | 11.10 |
| 267.000 | 0.00 | 0.00 | 0.000 | 11.10 |
| 267.600 | 0.00 | 0.00 | 0.000 | 11.10 |
| 268.200 | 0.00 | 0.00 | 0.000 | 11.10 |
| 268.800 | 0.00 | 0.00 | 0.000 | 11.10 |
| 269.400 | 0.00 | 0.00 | 0.000 | 11.10 |
| 270.000 | 0.00 | 0.00 | 0.000 | 11.10 |
| 270.600 | 0.00 | 0.00 | 0.000 | 11.10 |
| 271.200 | 0.00 | 0.00 | 0.000 | 11.10 |
| 271.800 | 0.00 | 0.00 | 0.000 | 11.10 |
| 272.400 | 0.00 | 0.00 | 0.000 | 11.10 |
| 273.000 | 0.00 | 0.00 | 0.000 | 11.10 |
| 273.600 | 0.00 | 0.00 | 0.000 | 11.10 |
| 274.200 | 0.00 | 0.00 | 0.000 | 11.10 |
| 274.800 | 0.00 | 0.00 | 0.000 | 11.10 |
| 275.400 | 0.00 | 0.00 | 0.000 | 11.10 |
| 276.000 | 0.00 | 0.00 | 0.000 | 11.10 |
| 276.600 | 0.00 | 0.00 | 0.000 | 11.10 |
| 277.200 | 0.00 | 0.00 | 0.000 | 11.10 |
| 277.800 | 0.00 | 0.00 | 0.000 | 11.10 |
| 278.400 | 0.00 | 0.00 | 0.000 | 11.10 |
| 279.000 | 0.00 | 0.00 | 0.000 | 11.10 |
| 279.600 | 0.00 | 0.00 | 0.000 | 11.10 |
| 280.200 | 0.00 | 0.00 | 0.000 | 11.10 |
| 280.800 | 0.00 | 0.00 | 0.000 | 11.10 |
| 281.400 | 0.00 | 0.00 | 0.000 | 11.10 |

**BASIN FULLY
DRAINED IN 4.44
HOURS**

Graph Data Table - New Graph

| Time (min) | BASIN - 100 year - Flow (Total In) (ft ³ /s) | BASIN - 100 year - Flow (Total Out) (ft ³ /s) | BASIN - 100 year - Volume (ft ³) | BASIN - 100 year - Elevation (ft) |
|---------------|--|---|--|---|
| 1,438.200 | 0.00 | 0.00 | 0.000 | 11.10 |
| 1,438.800 | 0.00 | 0.00 | 0.000 | 11.10 |
| 1,439.400 | 0.00 | 0.00 | 0.000 | 11.10 |
| 1,440.000 | 0.00 | 0.00 | 0.000 | 11.10 |





PROJECT NAME: Rumson Road
PROJECT NUMBER: 15053.003
DESIGN BY: MK
CHECK BY:
DATE: 1-21-2021

POST-DEVELOPMENT DRAINAGE AREA #2

DA #2

TOTAL AREA= 0.21 Acres

RUNOFF COEFFICIENT

| SURFACE TYPE | AREA, A (ACRES) | RUNOFF COEFF. (C) | A x C | COMPOSITE RUNOFF COEFF. C = (A x C)/ A |
|--------------|-----------------|-------------------|-------------|--|
| LAWN 'D' | 0.12 | 0.65 | 0.08 | |
| WOODS 'D' | 0.09 | 0.79 | 0.07 | |
| | | | | |
| | | | | |
| | | | | |
| | 0.21 | | 0.15 | 0.71 |

RAINFALL INTENSITY CURVE - NOAA, 5 MIN.

2-YR. RUNOFF CALCULATION

i 2yr = 4.54 in/hr A = 0.21 acres C = 0.71

$$Q=CiA$$

$$Q \text{ 2yr} = 0.68 \text{ cfs}$$

10-YR. RUNOFF CALCULATION

i 10yr = 6.43 in/hr A = 0.21 acres C = 0.71

$$Q=CiA$$

$$Q \text{ 10yr} = 0.96 \text{ cfs}$$

25-YR. RUNOFF CALCULATION

i 25yr = 7.31 in/hr A = 0.21 acres C = 0.71

$$Q=CiA$$

$$Q \text{ 25yr} = 1.09 \text{ cfs}$$

100-YR. RUNOFF CALCULATION

i 100yr = 8.53 in/hr A = 0.21 acres C = 0.71

$$Q=CiA$$

$$Q \text{ 100yr} = 1.27 \text{ cfs}$$



TELEPHONE : (732) 312-9800
FAX : (732) 312-9801

1800 ROUTE 34, SUITE 101
WALL, NEW JERSEY 07719

| | | |
|-----------------|--|-----------------|
| PROJECT NUMBER: | 15053.003 | |
| PROJECT NAME: | Multi-Family Major Site plan for Rumson Road | |
| CALCULATED BY: | SP | DATE: 1/20/2021 |
| CHECKED BY: | DATE: | |
| REVISED BY: | DATE: | |

Sheet: 1 of 1

TIME OF CONCENTRATION CALCULATOR

| | | | |
|---------------------|----------------------------|-------------------------|----------|
| DRAINAGE AREA NAME: | Drainage Area 2 - Proposed | DRAINAGE AREA NOTATION: | DA2 - Pr |
|---------------------|----------------------------|-------------------------|----------|

Sheet Flow:

Segment 1

| | | |
|---|----------------------------|---------|
| Surface Type: | Grass: Short-grass prairie | |
| Slope of land surface, S: | 0.180 | ft/ft |
| n-value (from Table 15-1): | 0.15 | --- |
| Limiting Length of flow, l: | 14.0 | ft |
| 2-year, 24 hours rainfall, P ₂ : | 3.410 | in |
| Travel time, T _t : | 0.8 | minutes |

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(nl)^{0.8}}{(P_2)^{0.5} S^{0.4}} \quad (\text{Eq 15-8})$$

Sheet Flow:

Segment 2

| | | |
|---|----------------------------|---------|
| Surface Type: | Grass: Short-grass prairie | |
| Slope of land surface, S: | 0.045 | ft/ft |
| n-value (from Table 15-1): | 0.15 | --- |
| Limiting Length of flow, l: | 17.0 | ft |
| 2-year, 24 hours rainfall, P ₂ : | 3.410 | in |
| Travel time, T _t : | 1.7 | minutes |

Shallow Concentrated Flow:

Segment 3

| | | |
|-------------------------------|--|---------|
| Surface Type: | Minimum tillage cultivation, contour or strip-cropped, and woodlands | |
| Flow length, l: | 58 | ft |
| Slope of land surface, S: | 0.005 | ft/ft |
| n-value (from Table 15-3): | 0.101 | --- |
| Average velocity, V: | 0.356 | ft/s |
| Travel time, T _t : | 2.7 | minutes |

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{l}{3,600V} \quad (\text{Eq 15-1})$$

Total Time of Concentration:

5

minutes

user input



PROJECT NAME: Rumson Road
PROJECT NUMBER: 15053.003
DESIGN BY: MK
CHECK BY:
DATE: 1-21-2021

POST-DEVELOPMENT DRAINAGE AREA #3

DA #3

TOTAL AREA=

2.72 Acres

RUNOFF COEFFICIENT

| SURFACE TYPE | AREA, A (ACRES) | RUNOFF COEFF. (C) | A x C | COMPOSITE RUNOFF COEFF. C = (A x C)/ A |
|--------------|--------------------|----------------------|-------------|---|
| IMPERVIOUS | 0.04 | 0.99 | 0.04 | |
| LAWN 'C' | 0.73 | 0.51 | 0.37 | |
| LAWN 'D' | 0.69 | 0.65 | 0.45 | |
| WOODS 'C' | 0.73 | 0.59 | 0.43 | |
| WOODS 'D' | 0.53 | 0.79 | 0.42 | |
| | 2.72 | | 1.71 | 0.63 |

RAINFALL INTENSITY CURVE - NOAA, 12 MIN.

2-YR. RUNOFF CALCULATION

i 2yr = 3.38 in/hr A = 2.72 acres C = 0.63

$$Q=CiA$$

Q 2yr = **5.78** cfs

10-YR. RUNOFF CALCULATION

i 10yr = 4.82 in/hr A = 2.72 acres C = 0.63

$$Q=CiA$$

Q 10yr = **8.24** cfs

25-YR. RUNOFF CALCULATION

i 25yr = 5.45 in/hr A = 2.72 acres C = 0.63

$$Q=CiA$$

Q 25yr = **9.32** cfs

100-YR. RUNOFF CALCULATION

i 100yr = 6.33 in/hr A = 2.72 acres C = 0.63

$$Q=CiA$$

Q 100yr = **10.82** cfs



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FAX : (732) 312-9801

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WALL, NEW JERSEY 07719

| | | |
|-----------------|--|-----------------|
| PROJECT NUMBER: | 15053.003 | |
| PROJECT NAME: | Multi-Family Major Site plan for Rumson Road | |
| CALCULATED BY: | SP | DATE: 1/20/2021 |
| CHECKED BY: | DATE: | |
| REVISED BY: | DATE: | |

Sheet: 1 of 1

TIME OF CONCENTRATION CALCULATOR

| | | | |
|---------------------|----------------------------|-------------------------|----------|
| DRAINAGE AREA NAME: | Drainage Area 3 - Proposed | DRAINAGE AREA NOTATION: | DA3 - Pr |
|---------------------|----------------------------|-------------------------|----------|

Sheet Flow:

Segment 1

| | | |
|---|--|---------|
| Surface Type: | Smooth surface (concrete, asphalt, gravel, or bare soil) | |
| Slope of land surface, S: | 0.010 | ft/ft |
| n-value (from Table 15-1): | 0.011 | --- |
| Limiting Length of flow, l: | 12.5 | ft |
| 2-year, 24 hours rainfall, P ₂ : | 3.410 | in |
| Travel time, T _t : | 0.3 | minutes |

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(nl)^{0.8}}{(P_2)^{0.5} S^{0.4}} \quad (\text{Eq 15-8})$$

Shallow Concentrated Flow:

Segment 2

| | | |
|-------------------------------|---------------------|---------|
| Surface Type: | Short-grass pasture | |
| Flow length, l: | 154.5 | ft |
| Slope of land surface, S: | 0.016 | ft/ft |
| n-value (from Table 15-3): | 0.073 | --- |
| Average velocity, V: | 0.881 | ft/s |
| Travel time, T _t : | 2.9 | minutes |

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{l}{3,600V} \quad (\text{Eq 15-1})$$

Shallow Concentrated Flow:

Segment 3

| | | |
|-------------------------------|--|---------|
| Surface Type: | Minimum tillage cultivation, contour or strip-cropped, and woodlands | |
| Flow length, l: | 260 | ft |
| Slope of land surface, S: | 0.010 | ft/ft |
| n-value (from Table 15-3): | 0.101 | --- |
| Average velocity, V: | 0.503 | ft/s |
| Travel time, T _t : | 8.6 | minutes |

Total Time of Concentration:

12

minutes

user input



PROJECT NAME: Rumson Road
PROJECT NUMBER: 15053.003
DESIGN BY: MK
CHECK BY:
DATE: 1-21-2021

POST-DEVELOPMENT DRAINAGE AREA #4

DA #4

TOTAL AREA=

1.32 Acres

RUNOFF COEFFICIENT

| SURFACE TYPE | AREA, A (ACRES) | RUNOFF COEFF. (C) | A x C | COMPOSITE RUNOFF COEFF. C = (A x C)/ A |
|--------------|--------------------|----------------------|-------------|---|
| IMPERVIOUS | 0.08 | 0.99 | 0.08 | |
| LAWN 'C' | 0.26 | 0.51 | 0.13 | |
| LAWN 'D' | 0.11 | 0.65 | 0.07 | |
| WOODS 'C' | 0.61 | 0.59 | 0.36 | |
| WOODS 'D' | 0.26 | 0.79 | 0.21 | |
| | 1.32 | | 0.85 | 0.64 |

RAINFALL INTENSITY CURVE - NOAA, 18 MIN.

2-YR. RUNOFF CALCULATION

i 2yr = 2.84 in/hr A = 1.32 acres C = 0.64

$$Q=CiA$$

$$Q \text{ 2yr} = 2.41 \text{ cfs}$$

10-YR. RUNOFF CALCULATION

i 10yr = 4.09 in/hr A = 1.32 acres C = 0.64

$$Q=CiA$$

$$Q \text{ 10yr} = 3.47 \text{ cfs}$$

25-YR. RUNOFF CALCULATION

i 25yr = 4.62 in/hr A = 1.32 acres C = 0.64

$$Q=CiA$$

$$Q \text{ 25yr} = 3.92 \text{ cfs}$$

100-YR. RUNOFF CALCULATION

i 100yr = 5.42 in/hr A = 1.32 acres C = 0.64

$$Q=CiA$$

$$Q \text{ 100yr} = 4.60 \text{ cfs}$$



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| | | |
|-----------------|--|-----------------|
| PROJECT NUMBER: | 15053.003 | |
| PROJECT NAME: | Multi-Family Major Site plan for Rumson Road | |
| CALCULATED BY: | SP | DATE: 1/20/2021 |
| CHECKED BY: | DATE: | |
| REVISED BY: | DATE: | |

Sheet: 1 of 1

TIME OF CONCENTRATION CALCULATOR

| | | | |
|---------------------|----------------------------|-------------------------|----------|
| DRAINAGE AREA NAME: | Drainage Area 4 - Proposed | DRAINAGE AREA NOTATION: | DA4 - Pr |
|---------------------|----------------------------|-------------------------|----------|

Sheet Flow:

Segment 1

| | | |
|---|-------------------------|---------|
| Surface Type: | Woods: Light underbrush | |
| Slope of land surface, S: | 0.025 | ft/ft |
| n-value (from Table 15-1): | 0.4 | --- |
| Limiting Length of flow, l: | 39.5 | ft |
| 2-year, 24 hours rainfall, P ₂ : | 3.410 | in |
| Travel time, T _t : | 9.1 | minutes |

calculations for sheet flow based upon Equation 15-8 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{0.007(nl)^{0.8}}{(P_2)^{0.5} S^{0.4}} \quad (\text{Eq 15-8})$$

Shallow Concentrated Flow:

Segment 2

| | | |
|-------------------------------|--|---------|
| Surface Type: | Minimum tillage cultivation, contour or strip-cropped, and woodlands | |
| Flow length, l: | 311 | ft |
| Slope of land surface, S: | 0.013 | ft/ft |
| n-value (from Table 15-3): | 0.101 | --- |
| Average velocity, V: | 0.574 | ft/s |
| Travel time, T _t : | 9.0 | minutes |

calculations for shallow concentrated flow based upon Equation 15-1 from "Part 630 Hydrology, National Engineering Handbook: Chapter 15 - Time of Concentration" issued by the United States Department of Agriculture, Natural Resources Conservation Service.

$$T_t = \frac{l}{3,600V} \quad (\text{Eq 15-1})$$

| | | |
|--|--|--|
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|--|--|--|
| | | |
| | | |
| | | |
| | | |
| | | |

| | | | |
|------------------------------|----|---------|------------|
| Total Time of Concentration: | 18 | minutes | user input |
|------------------------------|----|---------|------------|

WATER QUALITY CALCULATIONS MANUFACTURED TREATMENT DEVICE

Date: January 08, 2020

Project: Lauriston Park, Rumson NJ

To Whom It May Concern,

The Kraken Filter for Lauriston Park is sized in accordance with its NJCAT approval. The system is approved for 80% TSS removal at a loading rate of 0.05 gpm/sq ft of surface area provided for each membrane filter cartridge. The design, sizing, and loading rate for this project will be reviewed by a Bio Clean representative for final approval to ensure the system is sized accordingly.

On this project, a total of 0.42 ac impervious is routed to the Kraken MTD. For this, we are proposing a Kraken 4-8 with 32 filters and a maximum treatment capacity 0.60 cfs. Each cartridge has capacity for 8.5 gpm or 0.019 cfs.

$$\text{Cartridge Treatment Capacity} = (\text{Loading rate}) * (\text{surface area})$$

$$= \frac{0.05 \frac{\text{gpm}}{\text{ft}^2} * 170 \text{ ft}^2}{448.8 \frac{\text{gpm}}{\text{cfs}}} = \mathbf{0.019 \text{ cfs}}$$

$$\text{Kraken Flow rate} = (\text{Cartridge Capacity}) * (\text{Number of Cartridges})$$

$$= 0.019 \text{ cfs} * 32 = \mathbf{0.60 \text{ cfs}}$$

$$\begin{aligned} \text{Cartridges required per mass load sizing} &= \frac{(DA) * (600 \text{ lb of tss per acre})}{\text{Cartridge removal rate}} \\ &= \frac{0.42 \text{ ac} * 600 \frac{\text{lb}}{\text{ac}}}{27.125 \text{ tss per cartridge}} = \mathbf{9.30 \text{ cartridges required}} \end{aligned}$$

The proposed Kraken 4-8 MTD is sufficient for this site and exceeds the 10 cartridges required per treatment drainage area. If you have any questions, please feel free to contact us at your convenience.

Sincerely,

Touyia Lee, EIT
Stormwater Engineer


A Forterra Company



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

Bureau of Nonpoint Pollution Control

Division of Water Quality

Mail Code 401-02B

Post Office Box 420

Trenton, New Jersey 08625-0420

609-633-7021 Fax: 609-777-0432

http://www.state.nj.us/dep/dwq/bnpc_home.htm

BOB MARTIN
Commissioner

Zach J. Kent
Director of Engineering
BioClean Environment Services, Inc.
398 Via El Centro
Oceanside, Ca 92058

Re: Revised MTD Laboratory Certification
Kraken Stormwater Filtration System by BioClean Environmental Services, Inc.
On-Line Installation

TSS Removal Rate 80%

Dear Mr. Kent:

This revised certification letter supersedes the Department's prior certification dated June 2, 2016. This revision was completed to reflect the updated Manufactured Treatment Device (MTD) scaling methodology for filtration MTDs as agreed upon by the manufacturers' working group and included in the NJCAT Interpretations document found at <http://www.njcat.org/uploads/docs/NJCATInterpretations-LabTestProtocols%20June%202017.pdf>. In part, the updated scaling for filtration MTDs is now calculated based on the sediment mass load capacity per filter cartridge or sediment mass load capacity per filter surface area. Based on the above decision, Table A-4 of the NJCAT Technology Verification report located at <http://www.njcat.org/uploads/newDocs/NJCATVerificationReportKrakenFilterAddendumFinal.pdf> has been updated, and Table 1 noted below has been modified accordingly. No other requirements within the previous certification have changed.

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). BioClean Environmental Services, Inc. has requested a Laboratory Certification for the Kraken Stormwater Filtration System.

This project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

The NJDEP certifies the use of the Kraken Stormwater Filtration System by BioClean Environmental Service, Inc., at a TSS removal rate of 80%, when designed, operated and maintained in accordance with the information provided in the Verification Appendix and subject to the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using to the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5. The MTFR is calculated based on a verified loading rate of 1.11×10^{-4} cfs/sf (0.05 gpm/sf) of effective filtration treatment area.
2. The Kraken Stormwater Filtration System shall be installed using the same configuration as the unit tested by NJCAT, and sized in accordance with the criteria specified in item 6 below.
3. This device cannot be used in series with another MTD or a media filter (such as a sand filter), to achieve an enhance removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in Chapter 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at www.njstormwater.org.
5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the Kraken Stormwater Filtration System which is attached to this document. However, it is recommended to review the maintenance website at <http://www.biocleanenvironmental.com/kraken-operation-and-maintenance/> for any changes to the maintenance requirements.
6. Sizing Requirements

The example below demonstrates the sizing procedure for a Kraken Stormwater Filtration System.

Example: A 0.25 acre impervious site is to be treated to 80% TSS removal using a Kraken Stormwater Filtration System. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

The selection of the appropriate model of the Kraken Stormwater Filtration System is based upon both the MTFR and the maximum inflow drainage area. It is necessary to calculate the required model using both methods and to use the largest model determined by the two methods.

Inflow Drainage Area Evaluation:

The drainage area to the Kraken Stormwater Filtration System in this example is 0.25 acres. Based upon the information in Table 1 below the Kraken Model KF-2.5-4 has a maximum inflow drainage area of 0.439 acres.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was determined based on the following:

$$\text{time of concentration} = 10 \text{ minutes}$$

$$i = 3.2 \text{ in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)}$$

$$c = 0.99 \text{ (curve number for impervious)}$$

$$Q = ciA = 0.99 \times 3.2 \times 0.25 = 0.79 \text{ cfs}$$

Given the site runoff is 0.79 cfs and based on Table 1 below the KF-8-8 has a MTFR of 0.909 cfs. The KF-8-8 model is the smallest model approved that could be used for this site that would treat the impervious area without exceeding the MTFR.

The sizing tables corresponding to the available system models are noted below:

Table 1 KRAKEN FILTER MODEL MTFRs, SEDIMENT STORAGE CAPACITY AND MAXIMUM ALLOWABLE DRAINAGE AREA

| Model | # of Cartridges | Maximum Treatment Flow Rate, MTFR ¹ (cfs) | 50% Maximum Sediment Storage Volume (ft ³) | Maximum Allowable Drainage Area Based on Loading ² (acres) |
|----------|-----------------|--|--|---|
| KF-2.5-4 | 8 | 0.152 | 1.37 | 0.362 |
| KF-4-4 | 16 | 0.303 | 1.70 | 0.723 |
| KF-4-6 | 24 | 0.455 | 2.59 | 1.085 |
| KF-4-8 | 32 | 0.606 | 3.44 | 1.447 |
| KF-8-8 | 48 | 0.909 | 8.38 | 2.170 |
| KF-8-10 | 66 | 1.250 | 11.5 | 2.983 |
| KF-8-12 | 78 | 1.477 | 13.4 | 3.527 |
| KF-8-14 | 96 | 1.818 | 16.9 | 4.340 |
| KF-8-16 | 114 | 2.159 | 19.9 | 5.153 |
| KF-10-16 | 152 | 2.879 | 24.0 | 6.872 |

Notes:

1. Calculated based on 1.11×10^{-4} cfs/sf (0.05gpm/sf) of effective filtration treatment area

2. Based upon the equation found in the NJDEP Filter Protocol Maximum Inflow Drainage Area (acres) = weight of TSS before 10% loss in MTFR (lbs)/600 lbs/acre of drainage area annually

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks,

indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Manual.

If you have any questions regarding the above information, please contact Shashi Nayak, of my office, at (609) 633-7021.

Sincerely,

A handwritten signature in black ink, appearing to read "James J. Murphy".

James J. Murphy, Chief
Bureau of Nonpoint Pollution Control

cc: Chron File
Richard Magee, NJCAT
Vincent Mazzei, DLUR
Gabriel Mahon, BNPC
Ravi Patraju, NJDEP

WATER QUALITY CALCULATIONS PERVIOUS PAVERS

Example 5-1: NJDEP 1.25-Inch/2-Hour Stormwater Quality Design Storm Hydrograph Computation with Modified Rational Method

PERVIOUS PAVERS AREA 1

$C = 0.78$ Average $I = 1.25\text{-inches}/2\text{-hours} = 0.625 \text{ inches per hour}$
 $\text{Area} = 0.18 \text{ Ac}$ $T_c = 15 \text{ minutes}$ Storm duration = 2 hours

off ra 5 Min. per second) = CIA

C = Rational runoff coefficient

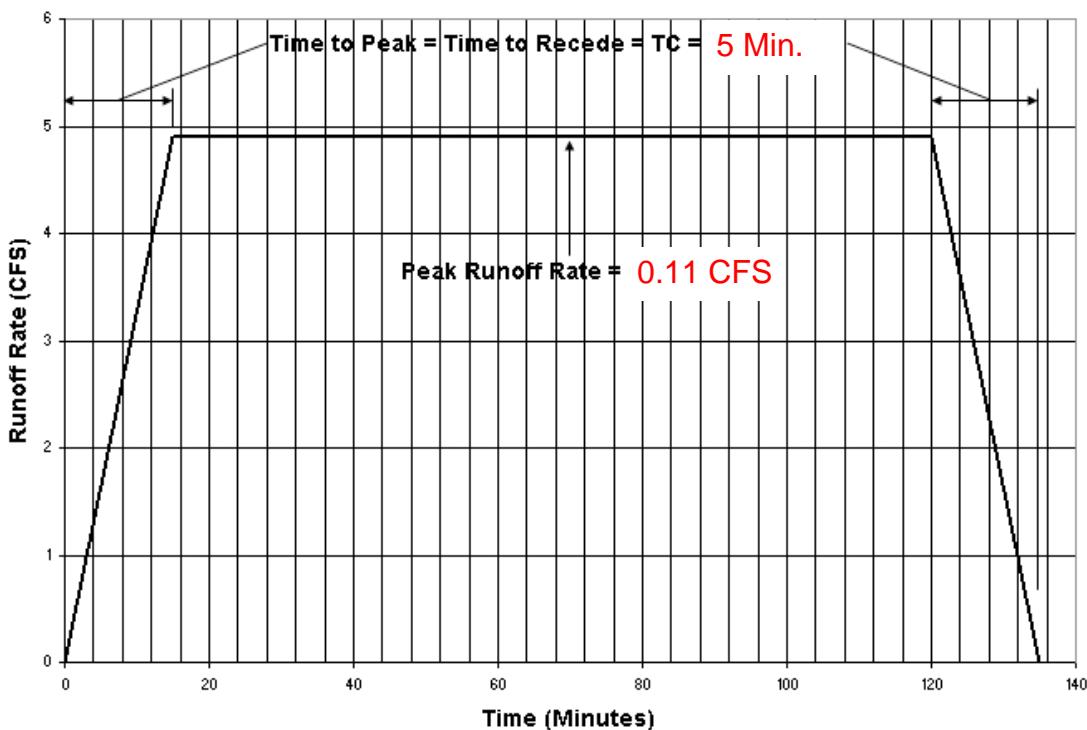
I = rainfall intensity (inches per hour)

A = drainage area (acres)

D = storm duration (hours)

$$Q = (0.99)(0.625 \text{ inches per hour})(0.18 \text{ acres}) = 0.11 \text{ CFS}$$

In the Modified Rational Method, the runoff hydrograph is then constructed as shown here:



Finally, the total runoff volume is equal to the area under the hydrograph, which is equal to the peak runoff rate times the duration of the storm.

$$V = \text{peak runoff rate} \times \text{storm duration} = Q \times D$$

$$V = 0.11 \text{ cubic feet/second} \times 2 \text{ hours} \times 3600 \text{ seconds/hour}$$

$$V = 792 \text{ Cubic Feet}$$

Stone Depth Calculation

Area of Pervious Pavers: 2787 SF

Required Volume: 792 Cubic Feet

Stone Porosity: 40%

Required Volume of Storage Bed =
 $792/(2787 \times 0.40)$

$$D = 0.71 \text{ ft} = 8.53 \text{ In}$$

Provide 9" of Stone

Rumson Road
Pervious Pavers 1 Underdrain Spacing Calculation

Input

S= Slope of Underdrain
 = 2.5 %

n= Manning's "n" for HDPE
 = 0.012

D= Diameter of Underdrain
 = 4.0 in

T= Maximum Allowable Drain time
 = 72.0 hr

L= Maximum Proposed Underdrain Length
 = 130.0 ft

D= Water Quality Storm Depth
 = 1.25 in

Underdrain Minimum Spacing

Manning's Equation:

Q= Rate of flow through underdrain
 = 0.326 ft³/s

$$Q = \left(\frac{1.49}{n}\right) A R^{2/3} \sqrt{S}$$

VOLUME: 2787 SF X 9" X 0.40
VOLUME: 836.1 CF

V= Volume that can be drained in 72 hrs
 = 84437 ft³

W= Maximum Allowable Underdrain Spacing
 = 6235.3 ft

**TOTAL VOLUME OF STONE
 IS 836.1 CF, THEREFORE
 SYSTEM WILL DRAIN IN 72
 HOURS**

WATER QUALITY CALCULATIONS PERVIOUS PAVERS

**Example 5-1: NJDEP 1.25-Inch/2-Hour Stormwater Quality Design Storm
Hydrograph Computation with Modified Rational Method**

PERVIOUS PAVERS AREA 2

$C = 0.78$ Average $I = 1.25\text{-inches}/2\text{-hours} = 0.625 \text{ inches per hour}$
 $\text{Area} = 0.05 \text{ Ac}$ $T_c = 15 \text{ minutes}$ Storm duration = 2 hours

off ra 5 Min. per second) = CIA

C = Rational runoff coefficient

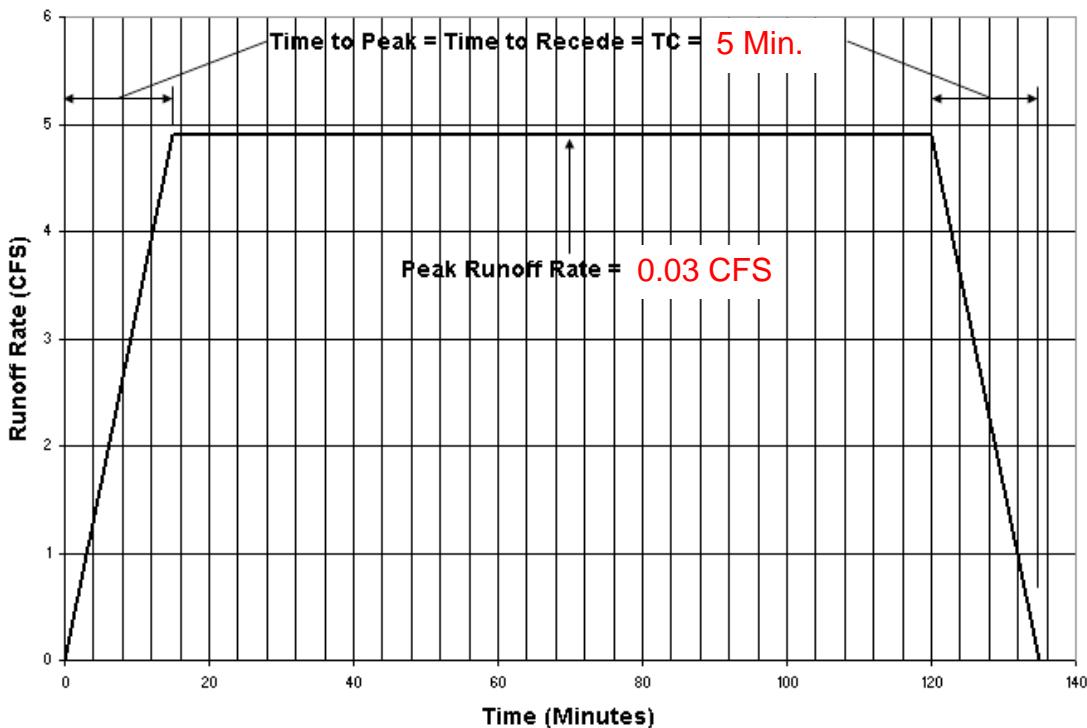
I = rainfall intensity (inches per hour)

A = drainage area (acres)

D = storm duration (hours)

$$Q = (0.99)(0.625 \text{ inches per hour})(0.05 \text{ acres}) = 0.03 \text{ CFS}$$

In the Modified Rational Method, the runoff hydrograph is then constructed as shown here:



Finally, the total runoff volume is equal to the area under the hydrograph, which is equal to the peak runoff rate times the duration of the storm.

$$V = \text{peak runoff rate} \times \text{storm duration} = Q \times D$$

$$V = 0.03 \text{ cubic feet/second} \times 2 \text{ hours} \times 3600 \text{ seconds/hour}$$

$$V = 216 \text{ Cubic Feet}$$

Stone Depth Calculation

Area of Pervious Pavers: 1961 SF

Required Volume: 216 Cubic Feet

Stone Porosity: 40%

Required Volume of Storage Bed =
 $216/(1961 \times 0.40)$

$D = 0.28 \text{ ft} = 3.36 \text{ In}$

Providing 9" of Stone

Rumson Road
Pervious Pavers 2 Underdrain Spacing Calculation

Input

S= Slope of Underdrain

$$= \boxed{2.5} \%$$

n= Manning's "n" for HDPE

$$= \boxed{0.012}$$

D= Diameter of Underdrain

$$= \boxed{4.0} \text{ in}$$

T= Maximum Allowable Drain time

$$= \boxed{72.0} \text{ hr}$$

L= Maximum Proposed Underdrain Length

$$= \boxed{112.0} \text{ ft}$$

D= Water Quality Storm Depth

$$= \boxed{1.25} \text{ in}$$

Underdrain Minimum Spacing

Manning's Equation:

Q= Rate of flow through underdrain
 $= \boxed{0.326} \text{ ft}^3/\text{s}$

$$Q = \left(\frac{1.49}{n}\right) A R^{2/3} \sqrt{S}$$

V= Volume that can be drained in 72 hrs
 $= \boxed{84437} \text{ ft}^3$

VOLUME: 1961 SF X 9" X 0.40

VOLUME: 588.3 CF

W= Maximum Allowable Underdrain Spacing
 $\boxed{7237.4} \text{ ft}$

**TOTAL VOLUME OF STONE
 IS 588.3 CF, THEREFORE
 SYSTEM WILL DRAIN IN 72
 HOURS**



APPENDIX E
Recharge Calculations

| Annual Groundwater Recharge Analysis (based on GSR-32) | | | | | | |
|---|--------------|---|------------|--------------------------------|--------------------------------|--|
| New Jersey Groundwater Recharge Spreadsheet Version 2003 November 2003 | | Project Name: 91 Rumson Road Description: 15053.003 Analysis Date: 01/12/21 | | | | |
| Pre-Developed Conditions | | | | | | |
| Land Segment | Area (acres) | TR-55 Land Cover | Soil | Annual Recharge (in) | Annual Recharge (cu.ft) | Climatic Factor |
| 1 | 1.49 | Woods | Holmdel | 13.0 | 70,432 | - |
| 2 | 0.86 | Impervious areas | Holmdel | 0.0 | - | - |
| 3 | 1.22 | Open space | Holmdel | 12.8 | 56,629 | - |
| 4 | 1.03 | Woods | Shrewsbury | 0.0 | - | - |
| 5 | 1.02 | Open space | Shrewsbury | 0.0 | - | - |
| 6 | 0.18 | Impervious areas | Shrewsbury | 0.0 | - | - |
| 7 | 0 | | | | | - |
| 8 | 0 | | | | | - |
| 9 | 0 | | | | | - |
| 10 | 0 | | | | | - |
| 11 | 0 | | | | | - |
| 12 | 0 | | | | | - |
| 13 | 0 | | | | | - |
| 14 | 0 | | | | | - |
| 15 | 0 | | | | | - |
| Total = | 5.8 | | | Total Annual Recharge (in) | Total Annual Recharge (cu-ft) | |
| | | | | 6.0 | 127,061 | Annual Recharge Requirements Calculation ↓ |
| % of Pre-Developed Annual Recharge to Preserve = | | | | Total = 5.8 | | Total Annual Recharge (in) |
| Post-Development Annual Recharge Deficit= | | | | 6.0 | 127,061 | Total Annual Recharge (cu.ft) |
| Recharge Efficiency Parameters Calculations (area averages) | | | | 100% | 100% | 100% |
| Post-Development Annual Recharge Deficit= -843 (cubic feet) | | | | 6.1 | 127,904 | 54,886 |
| Recharge Efficiency Parameters Calculations (area averages) | | | | Total Impermeable Area (sq.ft) | Total Impermeable Area (sq.ft) | Total Impermeable Area (sq.ft) |
| RWC= 4.10 (in) | | | | DRWC= 0.00 (in) | EDRWC= 0.00 (in) | (in) |
| ERWC = 0.92 (in) | | | | | | |

APPENDIX F
Low Impact Development

New Jersey Stormwater Best Management Practices Manual

February 2004

<http://www.state.nj.us/dep/watershedmgt/bmpmanualfeb2004.htm>

A P P E N D I X A

Low Impact Development Checklist

A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development

According to the NJDEP Stormwater Management Rules at N.J.A.C. 7:8, the groundwater recharge, stormwater quality, and stormwater quantity standards established by the Rules for major land development projects must be met by incorporating nine specific nonstructural stormwater management strategies into the project's design to the maximum extent practicable.

To accomplish this, the Rules require an applicant seeking land development approval from a regulatory board or agency to identify those nonstructural strategies that have been incorporated into the project's design. In addition, if an applicant contends that it is not feasible to incorporate any of the specific strategies into the project's design, particularly for engineering, environmental, or safety reasons, the Rules further require that the applicant provide a basis for that contention.

This checklist has been prepared to assist applicants, site designers, and regulatory boards and agencies in ensuring that the nonstructural stormwater management requirements of the Rules are met. It provides an applicant with a means to identify both the nonstructural strategies incorporated into the development's design and the specific low impact development BMPs (LID-BMPs) that have been used to do so. It can also help an applicant explain the engineering, environmental, and/or safety reasons that a specific nonstructural strategy could not be incorporated into the development's design.

The checklist can also assist municipalities and other land development review agencies in the development of specific requirements for both nonstructural strategies and LID-BMPs in zoning and/or land use ordinances and regulations. As such, where requirements consistent with the Rules have been adopted, they may supersede this checklist.

Finally, the checklist can be used during a pre-design meeting between an applicant and pertinent review personnel to discuss local nonstructural strategies and LID-BMPs requirements in order to optimize the development's nonstructural stormwater management design.

Since this checklist is intended to promote the use of nonstructural stormwater management strategies and provide guidance in their incorporation in land development projects, municipalities are permitted to revise it as necessary to meet the goals and objectives of their specific stormwater management program and plan within the limits of N.J.A.C. 7:8.

Low Impact Development Checklist

A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development

Municipality: Borough of Rumson

County: Monmouth County

Date: January 29, 2021

Review board or agency: Borough of Rumson

Proposed land development name: Preliminary and Final Major Site for Lauriston Park

Lot(s): 31 Block(s): 124

Project or application number: N/A

Applicant's name: Roger Mumford

Applicant's address: 247 Bridge Ave Red Bank, NJ 07701

Telephone: 732-842-1580

Email address: info@mumfordhomes.com

Designer's name: FRENCH AND PARRELLO ASSOCIATES

Designer's address: 1800 STATE ROUTE 34 SUITE 101, WALL NJ 07719

Telephone: 732-312-9800 Fax: 732-312-9801

Email address: MARK.KALUSZ@FPAENGINEERS.COM

Part 1: Description of Nonstructural Approach to Site Design

In narrative form, provide an overall description of the nonstructural stormwater management approach and strategies incorporated into the proposed site's design. Attach additional pages as necessary. Details of each nonstructural strategy are provided in Part 3 below.

The project site is located within Block 124, Lot 31 in the Borough of Rumson, Monmouth County, New Jersey. The subject property is located within the RR, Rumson Road Housing Zoning District. The current use of the property is an unoccupied existing residential dwelling and related amenities including driveways, detached garage, sheds, hardscaping, and debris piles. The applicant is proposing to demolish the existing dwelling and remove all existing amenities throughout the site and construct two triplex units, two carriage houses, two duplex units and a detached garage. Other associated improvements include driveways, landscaping, utilities, a stormwater management system and lighting.

In the proposed conditions, Drainage Area 1 is collected by a system of inlets, underdrains, pervious concrete pavers, a manufactured treatment device and storm sewers and then directed to a proposed underground detention basin located in the Southwest portion of the site. In Drainage Area 2, the proposed flows and impervious coverage have been reduced and the overall area has been reduced. In Drainage Area 3, the proposed flows and impervious coverage have been reduced and the overall area has been reduced. In Drainage Area 4, the proposed flows have been reduced and a portion of the proposed driveway will be constructed with pervious concrete pavers. The underground detention basin, manufactured treatment device and pervious concrete pavers have been designed to meet the requirements of the N.J.A.C. 7:8 "New Jersey Stormwater Management Rules" (NJMSR).

Part 2: Review of Local Stormwater Management Regulations

Title and date of stormwater management regulations used in development design:

STORMWATER MANAGEMENT RULES N.J.A.C 7:8

Do regulations include nonstructural requirements?

Yes: X No: _____

If yes, briefly describe: PERVIOUS PAVERS AND REFER TO LOW IMPACT DEVELOPMENT NARRATIVE IN THE STORMWATER MANAGEMENT REPORT

List LID-BMPs prohibited by local regulations: N/A

Pre-design meeting held? Yes: _____ Date: _____ No: X

Meeting held with: _____

Pre-design site walk held? Yes: _____ Date: _____ No: X

Site walk held with: _____

Other agencies with stormwater review jurisdiction:

Name:

Required approval:

Name: _____

Required approval: _____

Name: _____

Required approval: _____

Part 3: Nonstructural Strategies and LID-BMPs in Design

3.1 Vegetation and Landscaping

Effective management of both existing and proposed site vegetation can reduce a development's adverse impacts on groundwater recharges and runoff quality and quantity. This section of the checklist helps identify the vegetation and landscaping strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to help maintain existing recharge rates and/or minimize or prevent increases in runoff quantity and pollutant loading.

A. Has an inventory of existing site vegetation been performed?
Yes: X No: _____

If yes, was this inventory a factor in the site's layout and design? Yes: X No: _____

B. Does the site design utilize any of the following nonstructural LID-BMPs?

Preservation of natural areas? Yes: X No: _____
If yes, specify % of site: 90%

Native ground cover? Yes: X No: _____
If yes, specify % of site: 90%

Vegetated buffers? Yes: X No: _____
If yes, specify % of site: 99%

C. Do the land development regulations require these nonstructural LID-BMPs?

Preservation of natural areas? Yes: _____ No: X
If yes, specify % of site: _____

Native ground cover? Yes: _____ No: X
If yes, specify % of site: _____

Vegetated buffers? Yes: X No: _____
If yes, specify % of site: 10%

D. If vegetated filter strips or buffers are utilized, specify their functions:

Reduce runoff volume increases through lower runoff coefficient:
Yes: X No: _____

Reduce runoff pollutant loads through runoff treatment:

Yes: X No: _____

Maintain groundwater recharge by preserving natural areas:

Yes: X No: _____

3.2 Minimize Land Disturbance

Minimizing land disturbance is a nonstructural LID-BMP that can be applied during both the development's construction and post-construction phases. This section of the checklist helps identify those land disturbance strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to minimize land disturbance and the resultant change in the site's hydrologic character.

A. Have inventories of existing site soils and slopes been performed?
Yes: X No: _____

If yes, were these inventories factors in the site's layout and design? Yes: X No: _____

B. Does the development's design utilize any of the following nonstructural LID-BMPs?

Restrict permanent site disturbance by land owners?
Yes: _____ No: X

If yes, how: _____

Restrict temporary site disturbance during construction?
Yes: X No: _____

If yes, how: DELINEATE LIMIT OF DISTURBACE WITH SILT FENCE

Consider soils and slopes in selecting disturbance limits?
Yes: X No: _____

If yes, how: AVOID DISTURBANCE TO STEEP SLOPES

C. Specify percentage of site to be cleared: 20%_Regraded: 40%

D. Specify percentage of cleared areas done so for buildings: 20%

For driveways and parking: 12%_For roadways: 10%

E. What design criteria and/or site changes would be required to reduce the percentages in C and D above? NONE

F. Specify site's hydrologic soil group (HSG) percentages:

HSG A: HSG B: N/A HSG C: N/A HSG D: N/A

G. Specify percentage of each HSG that will be permanently disturbed:

HSG A:N/A HSG B: N/A HSG C: 85 HSG D: 15

H. Locating site disturbance within areas with less permeable soils (HSG C and D) and minimizing disturbance within areas with greater permeable soils (HSG A and B) can help maintain groundwater recharge rates and reduce runoff volume increases. In light of the HSG percentages in F and G above, what other practical measures if any can be taken to achieve this?

Pervious pavers area being proposed, and groundwater recharge deficit has been met

I. Does the site include Karst topography? Yes: _____ No: X

If yes, discuss measures taken to limit Karst impacts:

3.3 Impervious Area Management

New impervious surfaces at a development site can have the greatest adverse effect on groundwater recharge and stormwater quality and quantity. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into a proposed development's design to comprehensively manage the extent and impacts of new impervious surfaces.

- A. Specify impervious cover at site: Existing: 17%, Proposed: 22%
- B. Specify maximum site impervious coverage allowed by regulations: 32%
- C. Compare proposed street cartway widths with those required by regulations: N/A

| Type of Street | Proposed Cartway Width (feet) | Required Cartway Width (feet) |
|---|-------------------------------|-------------------------------|
| Residential access – low intensity | | |
| Residential access – medium intensity | | |
| Residential access – high intensity with parking | | |
| Residential access – high intensity without parking | | |
| Neighborhood | | |
| Minor collector – low intensity without parking | | |
| Minor collector – with one parking lane | | |
| Minor collector – with two parking lanes | | |
| Minor collector – without parking | | |
| Major collector | | |

D. Compare proposed parking space dimensions with those required by regulations:

Proposed: 9'X18' Regulations: 9'X18'

E. Compare proposed number of parking spaces with those required by regulations:

Proposed: 36 TOTAL 1983 Regulations: N/A

F. Specify percentage of total site impervious cover created by buildings: 80%

By driveways and parking: 20% By roadways:

G. What design criteria and/or site changes would be required to reduce the percentages in F above?

NONE

H. Specify percentage of total impervious area that will be unconnected:

Total site: 20% Buildings: 0% Driveways and parking:

I. Specify percentage of total impervious area that will be porous:

Total site: 0 Buildings: 35% Driveways and parking: 0 Roads: 0

J. Specify percentage of total building roof area that will be vegetated: 0

K. Specify percentage of total parking area located beneath buildings: 0

L. Specify percentage of total parking located within multi-level parking deck: 0

3.4 Time of Concentration Modifications

Decreasing a site's time of concentration (Tc) can lead directly to increased site runoff rates which, in turn, can create new and/or aggravate existing erosion and flooding problems downstream. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to effectively minimize such Tc decreases.

When reviewing Tc modification strategies, it is important to remember that a drainage area's Tc should reflect the general conditions throughout the area. As a result, Tc modifications must generally be applied throughout a drainage area, not just along a specific Tc route.

A. Specify percentage of site's total stormwater conveyance system length that will be:

Storm sewer: 100% Vegetated swale: 0% Natural channel:

Stormwater management facility: 100% Other: _____

Note: the total length of the stormwater conveyance system should be measured from the site's downstream property line to the downstream limit of sheet flow at the system's headwaters.

B. What design criteria and/or site changes would be required to reduce the storm sewer percentages and increase the vegetated swale and natural channel percentages in A above?

STORM SEWER CONVEYANCE SYSTEM IS NECESSARY TO PREVENT EROSION, HOWEVER POROUS PAVERS HAS BEEN PROPOSED

C. In conveyance system subareas that have overland or sheet flow over impervious surfaces or turf grass, what practical and effective site changes can be made to:

Decrease overland flow slope: SLOPES HAVE BEEN REDUCED AND POROUS PAVERS HAVE BEEN PROPOSED

Increase overland flow roughness: N/A

3.5 Preventative Source Controls

The most effective way to address water quality concerns is by pollution prevention. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to reduce the exposure of pollutants to prevent their release into the stormwater runoff.

A. Trash Receptacles

Specify the number of trash receptacles provided: N/A

Specify the spacing between the trash receptacles: N/A

Compare trash receptacles proposed with those required by regulations:

Proposed: N/A Regulations: N/A

B. Pet Waste Stations- N/A

Specify the number of pet waste stations provided: _____

Specify the spacing between the pet waste stations: _____

Compare pet waste stations proposed with those required by regulations:

Proposed: _____ Regulations: _____

C. Inlets, Trash Racks, and Other Devices that Prevent Discharge of Large Trash and Debris

Specify percentage of total inlets that comply with the NJPDES storm drain inlet criteria: 100%

D. Maintenance Not Yet Determined

Specify the frequency of the following maintenance activities:

Street sweeping: Proposed: _____ Regulations: _____

Litter collection: Proposed: _____ Regulations: _____

Identify other stormwater management measures on the site that prevent discharge of large trash and debris:

N-ECO INLET GRATES, TRASH RACKS, POROUS PAVERS, MANUFACTURED TREATMENT DEVICE AND UNDERGROUND DETENTION BASIN

E. Prevention and Containment of Spills- N/A

Identify locations where pollutants are located on the site, and the features that prevent these pollutants from being exposed to stormwater runoff:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

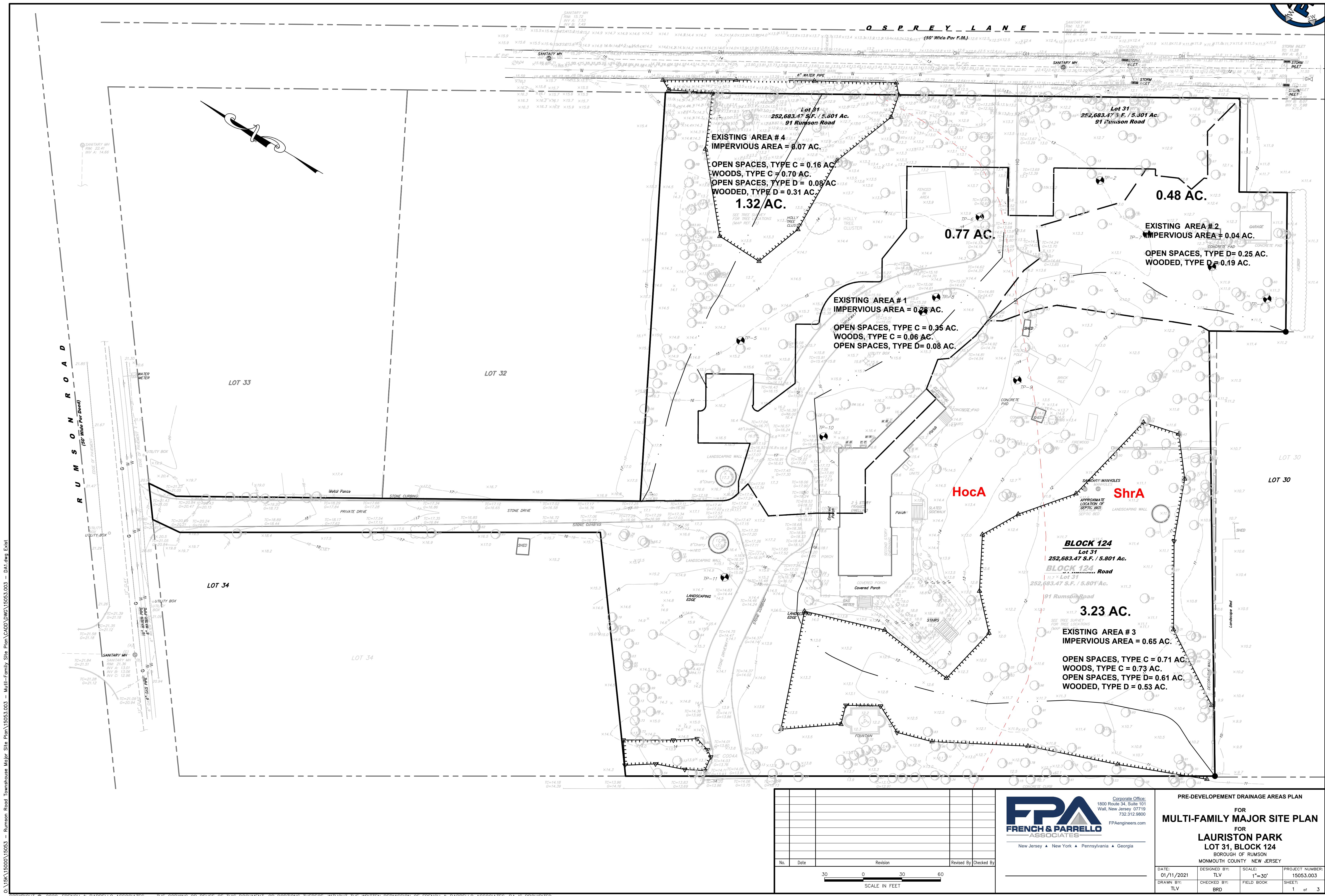
Part 4: Compliance with Nonstructural Requirements of NJDEP Stormwater Management Rules

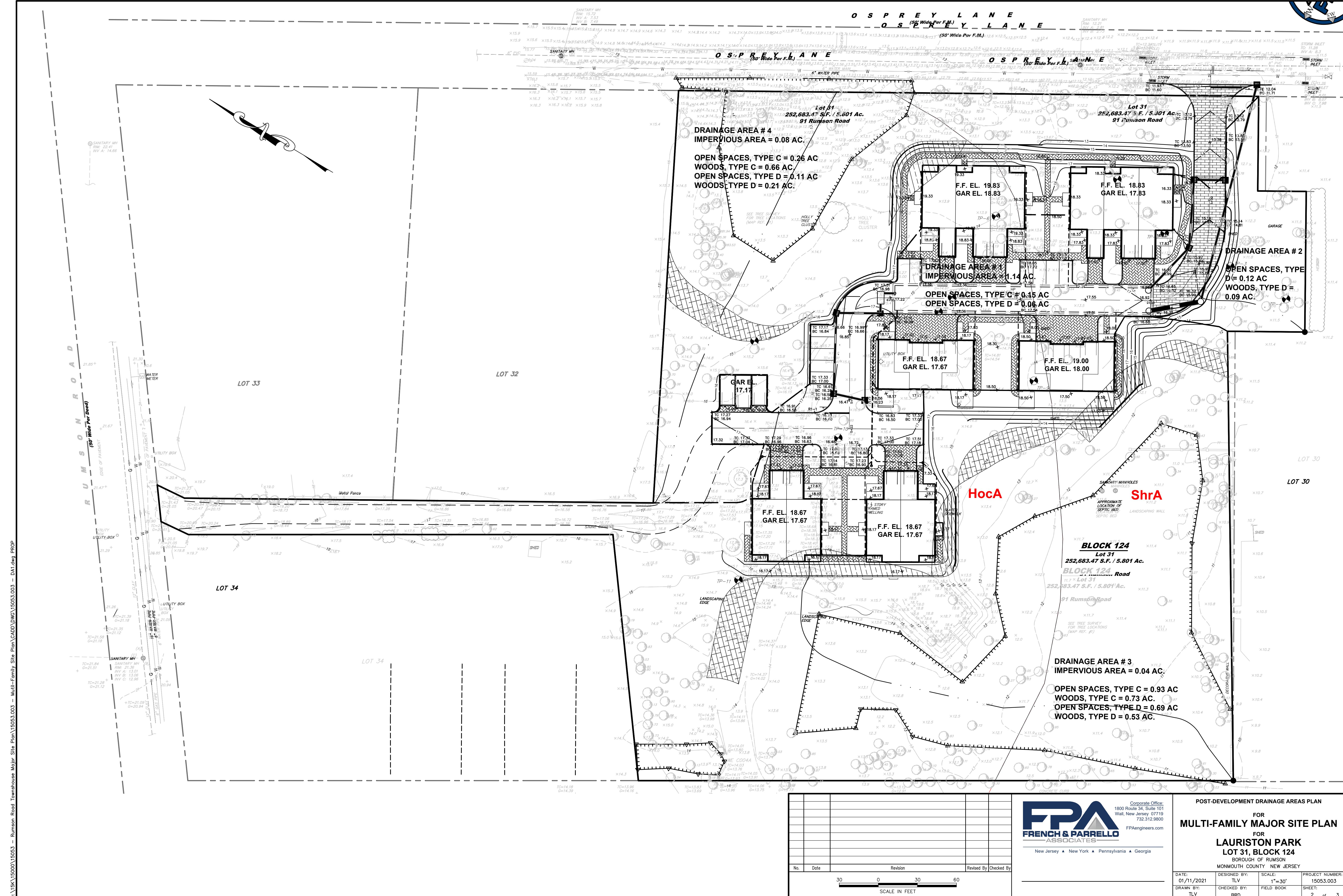
1. Based upon the checklist responses above, indicate which nonstructural strategies have been incorporated into the proposed development's design in accordance with N.J.A.C. 7:8-5.3(b):

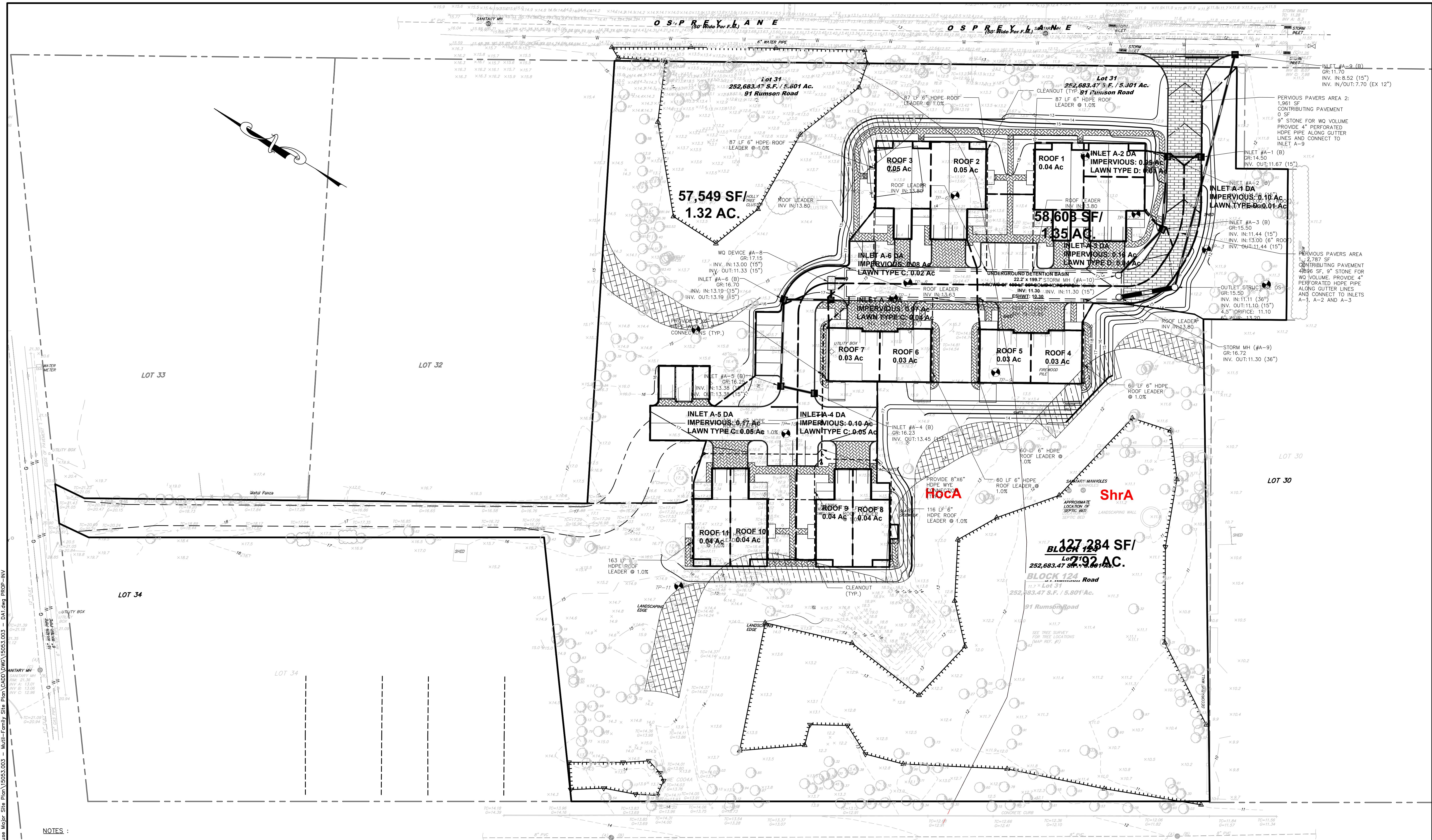
| No. | Nonstructural Strategy | Yes | No |
|-----|--|-----|----|
| 1. | Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss. | X | |
| 2. | Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces. | X | |
| 3. | Maximize the protection of natural drainage features and vegetation. | X | |
| 4. | Minimize the decrease in the pre-construction time of concentration. | X | |
| 5. | Minimize land disturbance including clearing and grading. | X | |
| 6. | Minimize soil compaction. | X | |
| 7. | Provide low maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides. | X | |
| 8. | Provide vegetated open-channel conveyance systems discharge into and through stable vegetated areas. | | X |
| 9. | Provide preventative source controls. | X | |

2. For those strategies that have not been incorporated into the proposed development's design, provide engineering, environmental, and/or safety reasons. Attached additional pages as necessary.

APPENDIX G
Drainage Area Maps







Townhouse Major Site Plan 15053.003 - Multi-Family Site Plan CADD DWG\15053.003 - DAT.dwg PROPP-INV

NOTES :

- BASE MAP INFORMATION OBTAINED FROM PLAN ENTITLED: "TOPOGRAPHIC SURVEY, PREPARED FOR LOT 31 BLOCK 124, SITUATED IN THE BOROUGH OF RUMSON, MONMOUTH COUNTY, NEW JERSEY" PREPARED BY FRENCH AND PARRELLO ASSOCIATES, DATED JULY 24, 2019.
- ARCHITECTURE FOOTPRINT OBTAINED FROM VIRTUOSO ARCHITECTURE, SEA GIRT, NEW JERSEY.
- THIS PLAN SHALL BE USED FOR ILLUSTRATION PURPOSES ONLY.
- THE FRESHWATER WETLANDS LINE ILLUSTRATED HAS BEEN DELINEATED BY A REPRESENTATIVE FRENCH & PARRELLO ASSOCIATES AND THE LINE NEEDS TO BE VERIFIED BY NJDEP BY A LETTER OF INTERPRETATION. THEREFORE THE LINE SHALL BE CONSIDERED APPROXIMATE UNTIL NJDEP CONFIRMS AND ISSUES THE LOI (LETTER OF INTERPRETATION).

| No. | Date | Revision | Revised By | Checked By |
|---------------|------|----------|------------|------------|
| 30 | 0 | 30 | 60 | |
| SCALE IN FEET | | | | |



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POST-DEVELOPMENT INDIVIDUAL DRAINAGE AREAS

FOR
MULTI-FAMILY MAJOR SITE PLAN

FOR
LAURISTON PARK

LOT 31, BLOCK 124
BOROUGH OF RUMSON
MONMOUTH COUNTY NEW JERSEY

DATE: 01/11/2021 DESIGNED BY: TLV SCALE: 1"=30' PROJECT NUMBER: 15053.003

DRAWN BY: TLV CHECKED BY: FIELD BOOK SHEET: 3 of 3